SAMSUNG

DIGITAL LASER MFP

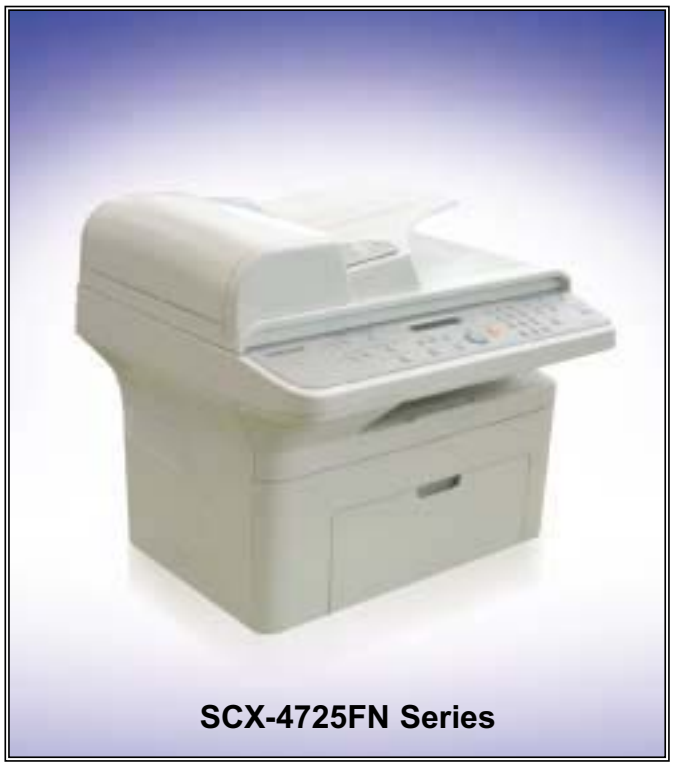
SCX-4725FN Series

SCX-4725FN/XAZ

Basic Model : SCX-4725FN

SERVICE *Manual*

DIGITAL LASER MFP



The keynote of Product

- Machine Life: 50,000Pages
- Cpu: Chorus M
- Device Memory: 32MB
- Resolution: 1200x1200dpi
- Option: N/A
- Printing Speed: 24ppm(A4, LTR)
- Print Language: PCL
- Path Type: C-Path
- Cassette Capa.: 250sheets
- Outlet Stacking Capa.: 100sheets
- Toner Cartridge: initial(1.5K), sales(3K)
- ADF Capacity: 30sheets
- Scan Method: 600 dpi Color CIS
- Copy Speed: SDMC: 22Cpm/Ltr,
  MDMC: 7Cpm/Ltr
- Interface: USB2.0

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1. Precautions

In order to prevent accidents and to prevent damage to the equipment please read the precautions listed below carefully before servicing the printer and follow them closely.

1.1 Safety Warning

(1) Only to be serviced by appropriately qualified service engineers.
High voltages and lasers inside this product are dangerous. This printer should only be serviced by a suitably trained and qualified service engineer.

(2) Use only Samsung replacement parts
There are no user serviceable parts inside the printer. Do not make any unauthorized changes or additions to the printer, these could cause the printer to malfunction and create electric shock or fire hazards.

(3) Laser Safety Statement
The Printer is certified in the U.S. to conform to the requirements of DHHS 21 CFR, chapter 1 Subchapter J for Class 1(1) laser products, and elsewhere, it is certified as a Class I laser product conforming to the requirements of IEC 825. Class I laser products are not considered to be hazardous. The laser system and printer are designed so there is never any human access to laser radiation above a Class I level during normal operation, user maintenance, or prescribed service condition.

Warning >> Never operate or service the printer with the protective cover removed from Laser/Scanner assembly. The reflected beam, although invisible, can damage your eyes. When using this product, these basic safety pre-cautions should always be followed to reduce risk of fire, electric shock, and injury to persons.

CAUTION - INVISIBLE LASER RADIATION WHEN THIS COVER OPEN. DO NOT OPEN THIS COVER.

VORSICHT - UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

ATTENTION - RAYONNEMENT LASER INVISIBLE EN CAS D'OUVERTURE. EXPOSITION DANGEREUSE AU FAISCEAU.

ATTENZIONE - RADIAZIONE LASER INVISIBILE IN CASO DI APERTURA. EVITARE L'ESPOSIZIONE AL FASCIO.

PRECAUCION - RADIACION LASER IVISIBLE CUANDO SE ABRE. EVITAR EXPONERSE AL RAYO.

ADVARSEL. - USYNLIG LASERSTRÅLNING VED ÅBNING, NÅR SIKKERHEDSBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSAETTELSE FOR STRÅLNING.

ADVARSEL. - USYNLIG LASERSTRÅLNING NÅR DEKSEL ÅPNES. STIRR IKKE INN I STRÅLEN. UNNGÅ EKSPONERING FOR STRÅLEN.

VARNING - OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN. STRÅLEN ÄR FARLIG.

VARO! - AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASER-SÄTEILYLLE ÄLÄ KATSO SÄTEESEEN.

注 意 - 严禁渴开此盖, 以免激光泄露灼伤

주 의 - 이 덮개를 열면 레이저광에 노출될 수 있으므로 주의하십시오.

1.2 Caution for safety

1.2.1 Toxic material

This product contains toxic materials that could cause illness if ingested.

(1) If the LCD control panel is damaged it is possible for the liquid inside to leak. This liquid is toxic. Contact with the skin should be avoided, wash any splashes from eyes or skin immediately and contact your doctor. If the liquid gets into the mouth or is swallowed see a doctor immediately.

(2) Please keep toner cartridges away from children. The toner powder contained in the toner cartridge may be harmful and if swallowed you should contact a doctor.

1.2.2 Electric Shock and Fire Safety Precautions

Failure to follow the following instructions could cause electric shock or potentially cause a fire.

(1) Use only the correct voltage, failure to do so could damage the printer and potentially cause a fire or electric shock.

(2) Use only the power cable supplied with the printer. Use of an incorrectly specified cable could cause the cable to overheat and potentially cause a fire.

(3) Do not overload the power socket, this could lead to overheating of the cables inside the wall and could lead to a fire.

(4) Do not allow water or other liquids to spill into the printer, this can cause electric shock. Do not allow paper clips, pins or other foreign objects to fall into the printer these could cause a short circuit leading to an electric shock or fire hazard..

(5) Never touch the plugs on either end of the power cable with wet hands, this can cause electric shock. When servicing the printer remove the power plug from the wall socket.

(6) Use caution when inserting or removing the power connector. The power connector must be inserted completely otherwise a poor contact could cause overheating possibly leading to a fire. When removing the power connector grip it firmly and pull.

(7) Take care of the power cable. Do not allow it to become twisted, bent sharply round corners or otherwise damaged. Do not place objects on top of the power cable. If the power cable is damaged it could overheat and cause a fire or exposed cables could cause an electric shock. Replace a damaged power cable immediately, do not reuse or repair the damaged cable. Some chemicals can attack the coating on the power cable, weakening the cover or exposing cables causing fire and shock risks.

(8) Ensure that the power sockets and plugs are not cracked or broken in any way. Any such defects should be repaired immediately. Take care not to cut or damage the power cable or plugs when moving the machine.

(9) Use caution during thunder or lightening storms. Samsung recommend that this machine be disconnected from the power source when such weather conditions are expected. Do not touch the machine or the power cord if it is still connected to the wall socket in these weather conditions.

(10) Avoid damp or dusty areas, install the printer in a clean well ventilated location. Do not position the machine near a humidifier. Damp and dust build up inside the machine can lead to overheating and cause a fire.

(11) Do not position the printer in direct sunlight. This will cause the temperature inside the printer to rise possibly leading to the printer failing to work properly and in extreme conditions could lead to a fire.

(12) Do not insert any metal objects into the machine through the ventilator fan or other part of the casing, it could make contact with a high voltage conductor inside the machine and cause an electric shock.

1.2.3 Handling Precautions

The following instructions are for your own personal safety, to avoid injury and so as not to damage the printer

(1) Ensure the printer is installed on a level surface, capable of supporting its weight. Failure to do so could cause the printer to tip or fall.
(2) The printer contains many rollers, gears and fans. Take great care to ensure that you do not catch your fingers, hair or clothing in any of these rotating devices.
(3) Do not place any small metal objects, containers of water, chemicals or other liquids close to the printer which if spilled could get into the machine and cause damage or a shock or fire hazard.
(4) Do not install the machine in areas with high dust or moisture levels, beside on open window or close to a humidifier or heater. Damage could be caused to the printer in such areas.
(5) Do not place candles, burning cigarettes, etc. on the printer, these could cause a fire.

1.2.4 Assembly / Disassembly Precautions

Replace parts carefully, always use Samsung parts. Take care to note the exact location of parts and also cable routing before dismantling any part of the machine. Ensure all parts and cables are replaced correctly. Please carry out the following procedures before dismantling the printer or replacing any parts.

(1) Check the contents of the machine memory and make a note of any user settings. These will be erased if the mainboard is replaced.
(2) Ensure that power is disconnected before servicing or replacing any electrical parts.
(3) Disconnect printer interface cables and power cables.
(4) Only use approved spare parts. Ensure that part number, product name, any voltage, current or temperature rating are correct.
(5) When removing or re-fitting any parts do not use excessive force, especially when fitting screws into plastic.
(6) Take care not to drop any small parts into the machine.
(7) Handling of the OPC Drum
- The OPC Drum can be irreparably damaged if it exposed to light.
  Take care not to expose the OPC Drum either to direct sunlight or to fluorescent or incandescent room lighting. Exposure for as little as 5 mins can damage the surface's photoconductive properties and will result in print quality degradation. Take extra care when servicing the printer. Remove the OPC Drum and store it in a black bag or other lightproof container. Take care when working with the covers(especially the top cover) open as light is admitted to the OPC area and can damage the OPC Drum.
- Take care not to scratch the green surface of OPC Drum Unit.
  If the green surface of the Drum Cartridge is scratched or touched the print quality will be compromised.

1.2.5 Disregarding this warning may cause bodily injury

(1) Be careful with the high temperature part.
The fuser unit works at a high temperature. Use caution when working on the printer. Wait for the fuser to cool down before disassembly.

(2) Do not put finger or hair into the rotating parts.
When operating a printer, do not put hand or hair into the rotating parts (Paper feeding entrance, motor, fan, etc.). If do, you can get harm.

(3) When you move the printer.
This printer weighs 11.2kg including toner cartridge and cassette. Use safe lifting and handling techniques. Back injury could be caused if you do not lift carefully.

(4) Ensure the printer is installed safely.
The printer weighs 11.2Kg, ensure the printer is installed on a level surface, capable of supporting its weight. Failure to do so could cause the printer to tip or fall possibly causing personal injury or damaging the printer.

(5) Do not install the printer on a sloping or unstable surface. After installation, double check that the printer is stable.

1.3 ESD Precautions

Certain semiconductor devices can be easily damaged by static electricity. Such components are commonly called “Electrostatically Sensitive (ES) Devices”, or ESDs. Examples of typical ESDs are: integrated circuits, some field effect transistors, and semiconductor “chip” components.

The techniques outlined below should be followed to help reduce the incidence of component damage caused by static electricity.

Caution >>Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

1. Immediately before handling a semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, employ a commercially available wrist strap device, which should be removed for your personal safety reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ESDs, place the assembly on a conductive surface, such as aluminum or copper foil, or conductive foam, to prevent electrostatic charge buildup in the vicinity of the assembly.
3. Use only a grounded tip soldering iron to solder or desolder ESDs.
4. Use only an “anti-static” solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESDs.
5. Do not use Freon-propelled chemicals. When sprayed, these can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective packaging until immediately before installing it. Most replacement ESDs are packaged with all leads shorted together by conductive foam, aluminum foil, or a comparable conductive material.
7. Immediately before removing the protective shorting material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
8. Maintain continuous electrical contact between the ESD and the assembly into which it will be installed, until completely plugged or soldered into the circuit.
9. Minimize bodily motions when handling unpackaged replacement ESDs. Normal motions, such as the brushing together of clothing fabric and lifting one’s foot from a carpeted floor, can generate static electricity sufficient to damage an ESD.

1.4 Super Capacitor or Lithium Battery Precautions

1. Exercise caution when replacing a super capacitor or Lithium battery. There could be a danger of explosion and subsequent operator injury and/or equipment damage if incorrectly installed.
2. Be sure to replace the battery with the same or equivalent type recommended by the manufacturer.
3. Super capacitor or Lithium batteries contain toxic substances and should not be opened, crushed, or burned for disposal.
4. Dispose of used batteries according to the manufacture’s instructions.

2. Product Specifications

2.1 Product Overview

Item	Descriptions	Remark
Basic Model	SCX-4725FN(4-in-1 Flatbed MFP) SCX-4725F(4-in-1 Flatbed MFP)	
Target User	SOHO, Economical(Speed/Price) Customer	
Customer Benefits (Sales Points)	- Compact Size - 24ppm/A4, 24ppm/Letter fastest speed in its price class - Favorite Copy - ID Card Copy - Toner Save	
Key Specification	- up to 24ppm/A4(Up to 24ppm/Letter) - 250 sheets Multi-Purpose type paper input/100 sheets Paper Output - 3,000pages toner capacity - 600dpi Print/Copy Resoulusion - Samsung Print Language - 32MB System memory - 30 ADF - 33.6 Kbps Fax Modem - 100 Speed Dial - 72 Hour Battery Back-up	

2.2 Specifications

• Product Specifications are subject to change without notice. See below for product specifications.

2.2.1 General Specifications

Item		Descriptions (SCX-4725FN / SCX-4725F)
Major Features		Copier, Print, Scan, Fax(SCX-4725FN)
Net Dimension (WxDxH)		438(W)*374(D)*368(H)(17.2x14.7x14.5")
Net Weight(Inc. Toner Cartridge)		11.2kg
CPU		Chorus-M (300MHz)
LCD		2 Line x 16 characters / 2Line x 8 characters(for china and korea)
Toner Save		Yes (With toner save button)
I/O Interface		USB2.0
Network Interface		Yes
OS Compatibility		Windows 98/Me/NT4.0/2000/XP, Various Linux OS (via USB interface only) including Red Hat 8.0~9.0, Fedora core 1~3, Mandrake 9.0~10.2, and SuSe 8.2~9.2, Mac 10.3
Power Requirement		110 ~ 127 VAC, 50/60 Hz, 5.5A 220 ~ 240 VAC, 50/60 Hz, 3A
Power Consumption		Sleep Mode : Under 12W Standby Mode : 70W Average : 400W (Print Mode)
Energy Star Compliant		Yes
Power Switch		Yes
Noise	Warm up Stand by Coping Printing	49 dBA 35 dBA 55 dBA 53dBA
Warm up time	from Power On Status from Sleep Mode (Recovery time)	Less than 30 seconds Less than 30 seconds
Max. Monthly Volume	Print	10,000 pages
	Scan	ADF: 2,500 pages, PLATEN: 1,700 pages
Average Monthly Print Volume		700 pages
Average Monthly SCAN Volume		150 pages
Machine Life	ENGINE SCANNER	5 years or 50,000 Pages. Whichever comes first ADF : 30,000 Pages, Platen : 20,000 Pages
Operation conditions	Temperature Humidity	10°C ~ 32 °C (50°F ~ 89°F) 20 % ~ 80 % RH
Approval		Class B
Device Memory		32MB
Page Counter		Yes
Print Configuration Sheet(System Data)		Yes

2.2.2 Print Specifications

Item		Descriptions (SCX-4725FN / SCX-4725F)
Method		Laser Beam Printing
Speed		Up to 24ppm in A4 (24ppm in Letter)
Emulation		PCL
Power Save		Yes(Interval option: 5, 10,15, 30, 45 minute)
Resolution	Normal	1200 x 1200 dpi
	RET	-
Memory		32MB
First Print Out	From Stand by	Approx. 10 seconds
Time	From Cold Status	Less than 30 seconds
Duplex	Print	Manual
WHQL Compliant		Window XP
Printable Area		A4: 201.6x288.6mm
		LTR: 207.6x270.6mm
		Legal: 207.6x347.6mm
		Folio: 207.6x322.6mm
Halftone (Gray Scale)		256 levels

2.2.3 Scan Specifications

Item		Descriptions (SCX-4725FN / SCX-4725F)
Compatibility		Twain standard / WIA Standard (Window 2000/XP)
Scan Method		600dpi Color CIS(Contact Image Sensor) Module
PC Scan Speed	Lineart, Halftone	10sec Platen(13sec ADF)
through Platen	Gray	23sec Platen (26sec ADF)
	Color 300dpi	65sec Platen(70sec ADF)
Resolution	Optical	600 x 600 dpi
	Enhanced	4800 x 4800 dpi
Halftone		256 levels
Scan Size	Max. Document Width	Max.216mm (8.5")
	Effective Scan Length	297 mm (11.7")
	Effective Scan Width	Letter/Legal: 208mm(8.2")A4: 202mm
Scan-to	Button	Yes
	Application	Yes
Scan Depth	Color	24 bit
	Mono	1bit for Line art, Halftone, 8 Bit for Gray scale

2.2.4 Copy Specifications

Item		Descriptions (SCX-4725FN / SCX-4725F)
Copy Speed		Up to 22ppm in A4 (22ppm in Letter)
Resolution	Optical	600*600 dpi (Scan:600*600dpi, Print: 600*600dpi) - Text & Text/Photo mode : 600*300dpi(ADF, Platen) - Photo mode : 600*600dpi (Platen), 600*300dpi(ADF)
	Enhanced	-
First Copy Out Time	Stand by	Approx. 16 seconds(ADF), Approx. 11 seconds(Platen)
	From Power Save Mode (110V only)	Approx. 46 seconds(ADF), Approx. 40 seconds(Platen)
Original Image type selection		Text, Text/Photo, Photo
Zoom Range		25-400%(Platen), 25-100%(ADF)
Multi Copy		1~99 Pages
Preset		[Original(100%)], [A4 →A5(71%)], [LGL→LTR(78%)], [LGL→A4(83%)], [A4 →LTR(94%)], [EXE →LTR(104%)], [A5 →A4(141%)], 25%, 50%, 150% 200%, 400%, [Custom: 25-400%)]
Darkness Control		3 level (Light, Normal, Dark)
Auto return to default mode		Yes (after 1 minute)- Time out option: 15, 30, 60, 180 sec., Off
Changeable Default mode		Darkness, Original Type, Reduce/Enlarge, No. of Copies
ID Card Copy	2-up	Yes (ADF Only)
	4-up	Yes (ADF Only)
	Collation	Yes (ADF Only)
	Autofit	Yes (Platen Only)
	LD Card Copy	Yes (Platen Only)
	Clone	Yes (Platen Only)
	Poster	Yes (Platen Only)

2.2.5 Telephone Specificationc

Item		SCX-4725FN
Handset		No
On hook Dial		Yes
Search		Yes(Phone Book)
1-Touch Dial		10 ea (0~9)
Speed dial		90 locations(10~99)
TAD I/F		Yes
Tone/Pulse		Tone →Default, Pulse →Changing in Tech Mode
Pause		Yes
Auto Redial		Yes
Last Number Redial		Yes
Distinctive Ring		Yes
Caller ID		No
Extention Phone Interface		Yes
Report & List	Tx/Rx Journal	Yes
Print out	Confirmation	Yes
	Help List	No
	Auto Dial List	Yes
	System Data	List all user setting
Sound Control	Ring Volume	Yes(Off,Low,MED,HIGH)
	Key Volume	Yes(On,Off)
	Alarm Volume	Yes(On,Off)
	Speaker	Yes(On,Off, Comm)

2.2.6 Fax Specifications

Item		SCX-4725FN
Compatibility		ITU-T G3
Modem Speed		33.6Kbps
TX Speed		3sec
Compression		MH/MR/MMR/JBIG
Color Fax		Yes(Tx Only)
ECM		Yes
Resolution	Std	203x98dpi
	Fine	203x196dpi
	S.Fine	300x300dpi
	Photo	203x196dpi
	Color	200x200dpi
	Auto Switching	Yes
Scan Speed	Standard	approx. 3sec (ADF)
		approx. 5sec (Platen)
	Fine	approx. 7sec (ADF)
		approx. 8sec (Platen)
	S.Fine	approx. 7sec (ADF)
		approx. 8sec (Platen)
Rx fax duplex print out		No
Multiple page scan speed (Memory Tx.)		7 cpm / Ltr (Standard Resoution Res.)
Receive Mode		Fax, TEL, Ans/Fax, DRPD
Memory	Capacity	2MB (When Power off Memory Back up)
	Optional Memory	No
	Max locations to store to 1 Group Dial	99 locations
	Fax Forward	Yes(On/Off)
	Broadcasting	109 locations(Max locations)
	Cover page	No
	Delayed fax	Yes
	Memory RX	Yes
Functions	Voice Request	No
	TTI	Yes
	RTI	Yes
	Polling	No
	Earth/Recall	No
	Auto Reduction	Yes
	RDS	Yes
Junk Fax barrier		Yes
Security Receive		Yes
Memory Back-up		Max. 72hours

2.2.7 Paper Handling Specifications

Item	SCX-4725FN / SCX-4725F
Input Capacity and Types	250-sheet Cassette Tray (75 g/㎡, 20 lbs)
Output Capacity and Types	100-sheet Face Down(75 g/㎡, 20 lbs)
Manual Tray	1 sheet
Media size	A4, A5, A6, Letter, Legal, Folio, Executive, ISO B5, JIS B5, Monarch, Envelope, No.10, DL, C5, C6
	76 x 127 mm (3" x 5") ~ 216 x 356 mm (8.5" x 14")
Media Type	Plain Paper, Transparency, Label, Envelope, Tick, Thin, Bond, Color Paper, Card Stock, Preprinted
Paper Weight	16~24lb (60 to 90g/㎡), Cassette Tray
	16~43lb (60 to 165g/㎡) for 1 sheet, Manual Tray
ADF Capacity	Up to 30 sheets of 20lb(75g/㎡) paper
ADF Document Size	Up to Legal

2.2.8 Software

Item		SCX-4725FN / SCX-4725F
Compatibility	DOS	No
	Win 3.x	No
	Win 95	No
	Win 98/ME	Yes
	Win NT 4.0	No
	Win 2000	Yes
	Win XP	Yes
	Mac	Yes (10.3)
	Linux	Yes
Driver	Printer	PCL
	TWAIN	Yes
	WIA	Yes
	ScanToPC	Yes
	PC-FAX	Yes (Send only)
Application	RCP	Yes
	Status monitor	Yes
	SmarThru4	Yes

2.2.9 Accessory

Items	SCX-4725FN	SCX-4725F
Quick Setup Guide	Yes (include Setup Guide and Function Guide)	
Quick User Guide	Yes (Korea Only)	
S/W CD ROM	3 CD (Contents; Electronic User Manual, SmarThru, Print Driver, Twain Driver, RCP)	
Toner Cartridge	1 EA	
Power Cable	1 EA	
Telephone Jack	No	1 EA
Printer Cable	No	No
Tray Coner	Yes	Yes

2.2.10 Consumables

Item	SCX-4725FN / SCX-4725F
Type	Single Cartridge
How to install	Front door open and front loading
Toner Yield	3,000 pages at ISO 19752 Std. Coverage(Ships with 1,000 pages Starter Toner Cartridge)
Code	SCX-4525D3
Level Sensor	-

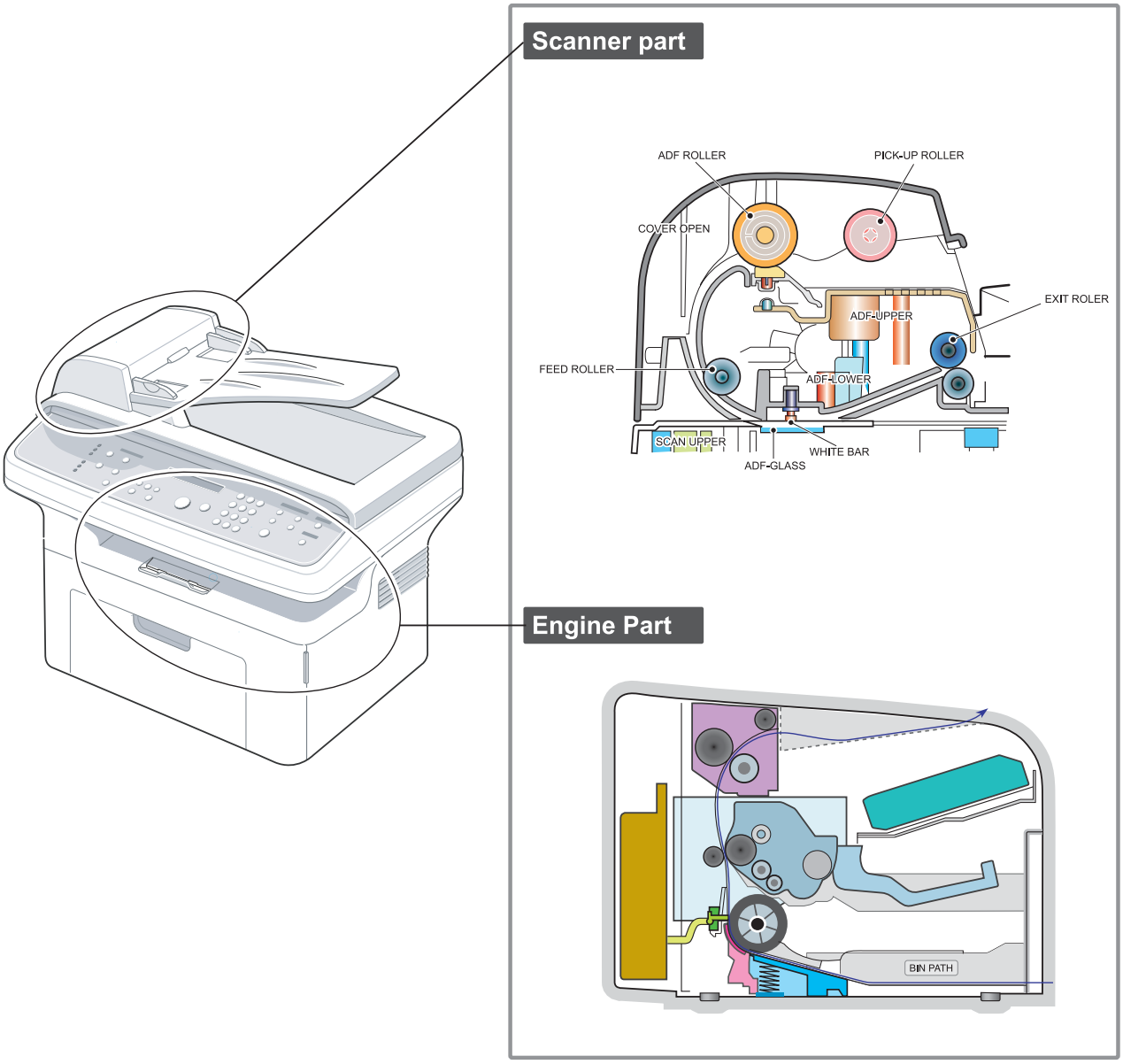
2.3 Model Comparison Table

Item		SCX - 4725FN (Whitney-2 24ppm)	Brother MFC 7820N	HP LJ 3055	Canon MF 5770
Model Image					
Print	Speed	24 ppm/A4 (25ppm/Ltr)	20 ppm/A4 (20ppm/Ltr)	18 ppm/A4 (19ppm/Ltr)	20 ppm/A4 (21ppm/Ltr)
	Resolution	1200 x 1200 dpi	2400 x 600 dpi	Up to 1200 x 1200 dpi	1200 x 600 dpi quality
	Emulation	PCL6, PS3	PCL6, PS3	PCL6, PS3	GDI
Copy	Speed	24 ppm/A4 (25ppm/Ltr)	20 ppm/A4 (20ppm/Ltr)	18 ppm/A4 (19ppm/Ltr)	20 ppm/A4 (21ppm/Ltr)
	Resolution	600 x 600 dpi	600 x 300 dpi	600 x 600 dpi	600 x 600 dpi
Scan	Resolution (Optical)	600 x 2400 dpi	600 x 2400 dpi	Up to 600 dpi	1200 x 2400 dpi
Fax	Modem Speed	33.6 Kbps	33.6 Kbps	33.6 Kbps	33.6 Kbps
	Memory	Approx. 320 pages	Approx. 600 pages	2 MB (Up to 110 pages)	Approx. 256 pages
	Auto Dial	1-touch 10 / Speed 190	208 Locations	119 Locations	Speed 12 / Coded 100
Paper	Input Capacity	250 -sheet MP Tray	250 - sheet CST Tray	250 -sheet MP Tray	250 - sheet CST Tray
	ADF Capacity	30 sheets	35 sheets	50 sheets	50 sheets
General	Net Dimension	438 x 374 x 368mm (TBD)	432 x 395 x 294 mm	497 x 406 x 393 mm	486 x 477 x 442mm
	Interface	USB 2.0, Ethernet 10/100 Base TX	USB 1.1, IEEE 1284, Ethernet 10/100 Base TX	USB 2.0, Ethernet 10/100 Base TX	USB 2.0, Ethernet 10/100 Base TX
Cons.	Type	Single Cartridge	2-piecese Cartridge	Single Cartridge	Single Cartridge
	Yield	3K (Starter 1.5K)	Toner 2,5K/ Drum 12K (Starter 1,5K/ 12K)	2K	2.5 K

3. System Overview

3.1 System Layout

The SCX-4725FN/4725F is roughly made up Main Control part, Operation Panel part, Scanner part, Line Interface part and Power part. Each Part is separated Module which focus on common and standard design of different kind products. main control part adopting Fax & LBP Printer exclusive Controller is chorus-M CPU(ASIC) and 1 Board. Scanner part is composed of ADF and Platen and is connected with Main by Harness.



3.1.1 Feeding section

There is a universal cassette which automatically loads paper and the manual feed which supplies paper single sheet at a time. The cassette has a friction pad which separates paper to ensure single sheet feeding, and it has a sensor, which checks when the paper tray is empty.

- Feeding Method: MP Cassette Type
- Feeding Standard: Center Loading
- Feeding Capacity: Cassette-150 sheets (75g/m2, 20lb paper standard)
  Manual 1 sheet (Paper, OHP, Envelop, etc.)
- Paper detecting sensor: Photo sensor
- Paper size sensor: None

3.1.2 Transfer Ass'y

This consists of the PTL (pre-transfer lamp) and the Transfer Roller. The PTL shines a light onto the OPC drum. This lowers the charge on the drum's surface and improves transfer efficiency.
The transfer roller transfers toner from the OPC drum surface to the paper.

- Life expectancy: Over 50,000 sheets (at 16~30°C)

3.1.3 Driver Ass'y

- Gear driven power unit. The motor supplies power to the paper feed unit, the fuser unit, and the toner cartridge.

3.1.4 Fixing Part(Fuser)

- The fuser consists of the Heat Lamp, Heat Roller, Pressure Roller, Thermistor, and Thermostat. It fixes toner to the paper using pressure and heat to complete the printing job.

3.1.4.1 Temperature-Intercepting Device (Thermostat)

The thermostat is a temperature sensing device, which cuts off the power to the heat lamp to prevent overheating fire when the heat lamp or heat roller overheats.

3.1.4.2 Temperature Detecting Sensor (Thermistor)

The Thermistor detects the surface temperature of the heat roller, this information is sent to the main processor which uses this information to regulate the temperature of the heat roller.

3.1.4.3 Heat Roller

The surface of the Heat Roller is heated by the Heat Lamp. As the paper passes between the Heat and Pressure rollers the toner is melted and fixed permanently to the paper. The surface of the roller is coated with Teflon. This ensures that toner does not adhere to the roller surface.

3.1.4.4 Pressure roller

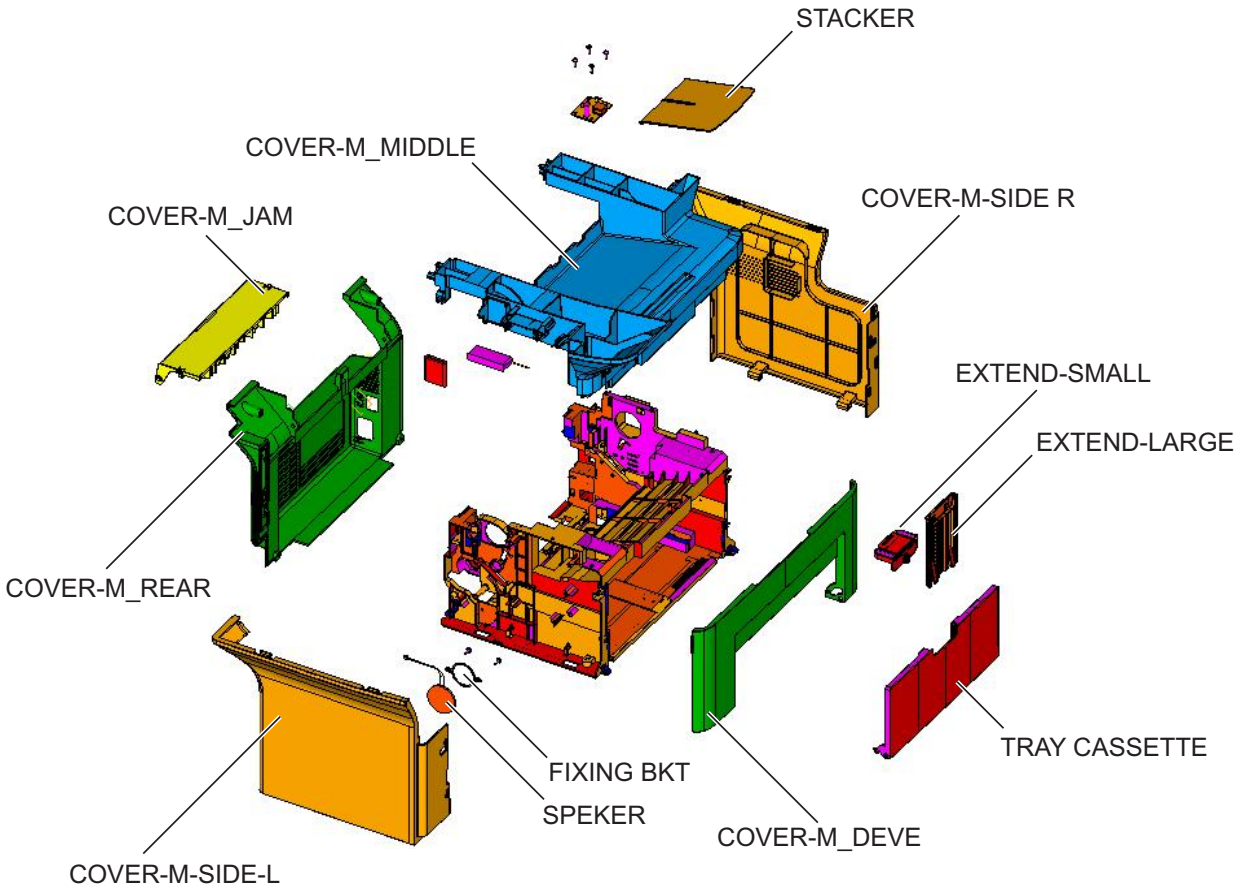
The Pressure Roller mounted under the heat roller, it is made of a silicon resin, and the surface of the roller is coated with Teflon. This ensures that toner does not adhere to the roller surface.

3.1.4.5 Safety Features

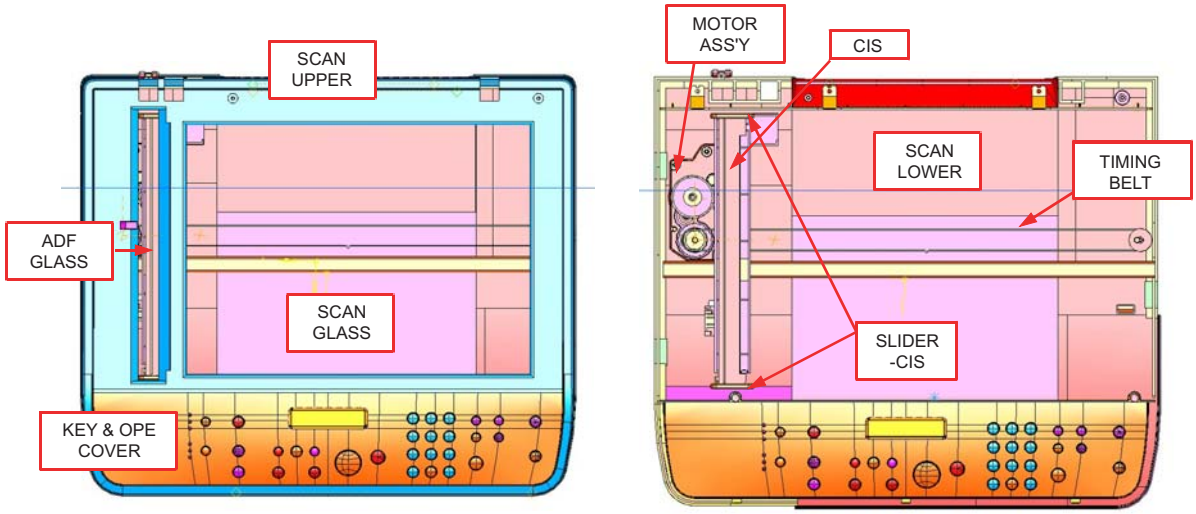
• To prevent overheating
  - 1st protection device: Hardware cuts off when overheated
  - 2nd protection device: Software cuts off when overheated
  - 3rd protection device: Thermostat cuts off mains power to the lamp.

• Safety device
  - Fuser power is cut off when the front cover is opened
  - LSU power is cut off when the front cover is opened
  - The temperature of the fuser cover's surface is maintained at less than 80°C to protect the user and a caution label is attached where the customer can see it easily when the rear cover is opened.

[Case part figure]



[Scan part figure]



3.2 Engine H/W Specification

1) Recording Method : LSU(Laser Scanning Unit)
2) Printing Speed : 24ppm
   (In continuing printing base Letter, printing pages from 2nd to last during 1min)
3) Recording Density : 1200 dpi
4) Cassette Capa. : Cassette ; 250sheets(75g/㎡ Base), 1-sheet Feeding : N/A((DRIVE Selection : Paper, OHP, Envelop - 1 sheet)
5) Manual Tray : All paper 1 sheet
6) Paper Size : Cassette ,Manual ; Width = 76 ~ 216mm, Length = 125mm ~ 356mm
7) Effective recording size
   - A4 :202 x 291 mm
   - Letter : 208 x273mm
   - Legal : 208 x 350 mm
   - Folio : 208 x 325 mm
   - TopMargin: 2 ±2 mm
   - Left, Right Margin : 2 ±2 mm

8) CRU(Toner Cartridge)Life : 3,000pages Printing(A4, ISO Standard Pattern Printing)
9) First Print Out Time : within 11sec (Standby)
10) Warming up time : within 35sec (Ambient : 25 °C)

3.2.1 Main Board Control Part

Main control part of SCX-4725FN is made of ASIC(CPU, Image processor, PC I/F part include, Scan interface part, FAX Modem part and Printing process I/F part. CPU handles the BUS control, I/O interface, scan interface, PC interface and other miscellaneous driver circuit.

1) Main Board
   - Main Board has a function of sending Current Image Video Data to LSU of the machine, controlling motor Driving Circuit and monitoring Paper Exit Sensor, Cover Open switch, OPE Panel Inputs.
2) Main Controller
   - CPU : Chorus-M is the main CPU and is made up on the 32bit RISC architecture using ARM 920T core. Main CPU controls the whole system according to the program code which stored in the Flash-ROM memory.
   - Operation Frequency : CPU Core -> over 300MHz, System Bus -> 100MHz
   - Summary of the Key Function Block:
     · 1.3V for internal Core, 3.3V for I/O Pad with 16KB I-Cache and 16KB D-Cache.
     · Image Processor included.
     · On-Chip clock generator with PLL.
     · Memory and External Bank Control.
     · DMA Control (16-Channel)
     · Interrupt Control.
     · 2-port USB Host/1-port USB device(ver 1.1) interface control.
     · Parallel interface control.
     · UART(1-Channel)

· Synchronous Serial Interface Control.
· A/D Converter(10-bit, 8channel).
· General I/O Port control.
· RTC with calendar function.
· S/W Assistant function(Rotator)

- Flash Memory : Stores system program and can be updated to the newer system program code through the PC interface. It stores the FAX Journal List, One Touch dial number, speed dial number, and machine configuration setup data.
  · Capcity : 16 Mbyte (NOR Type)
  · Access Time : 70 nsec

- SDRAM : SDRAM is used for Print Buffer, Scan buffer when scanning, ECM Buffer when FAX Receiving, and system working memory.
  · Capacity : 32 Mbyte
  · Access Time : 166MHz(Max)
  · Data Backup : 48 Hours
  · Backup Battery Charging Time : 100hours when completely discharged.

3.2.2 Scan Part

1) Image Signal Input Part
- Image Signal from CIS has a level of about 1.2V and is goes to ADC of Chorus2. After ADC, CIS analog signal will be converted to 8-bit Digital signal.

2) Image Processing
- On the surface of the original paper, the light from the CIS LED reflected and goes to the CIS Sensor. Then the light is converted to the appropriate voltage suitable for ADC input. Analog signal from CIS sensor is used for ADC input then is converted to 8-bit digital data. Image processor of the Chorus2 will do the Shading correction function at first, then Gamma correction function next. After then, the data goes to different module according to the copy or FAX resolution mode. When Text mode, the image data goes to LAT module, when Photo mode, the image data goes to Error Diffusion module, when PC-Scan mode, the image data goes directly to the PC through DMA access.

  · Summary of the Image sensor interface is as below;
    - Minimum Scan Line Time :1.5ms
    - Scan Resolution : 600*600 dpi
    - Scan Width : 208mm
    - Function
      · White Shading Correction
      · Gamma Correction
      · CIS Interface
      · 256 Gray Scale

3) CIS Driving Part

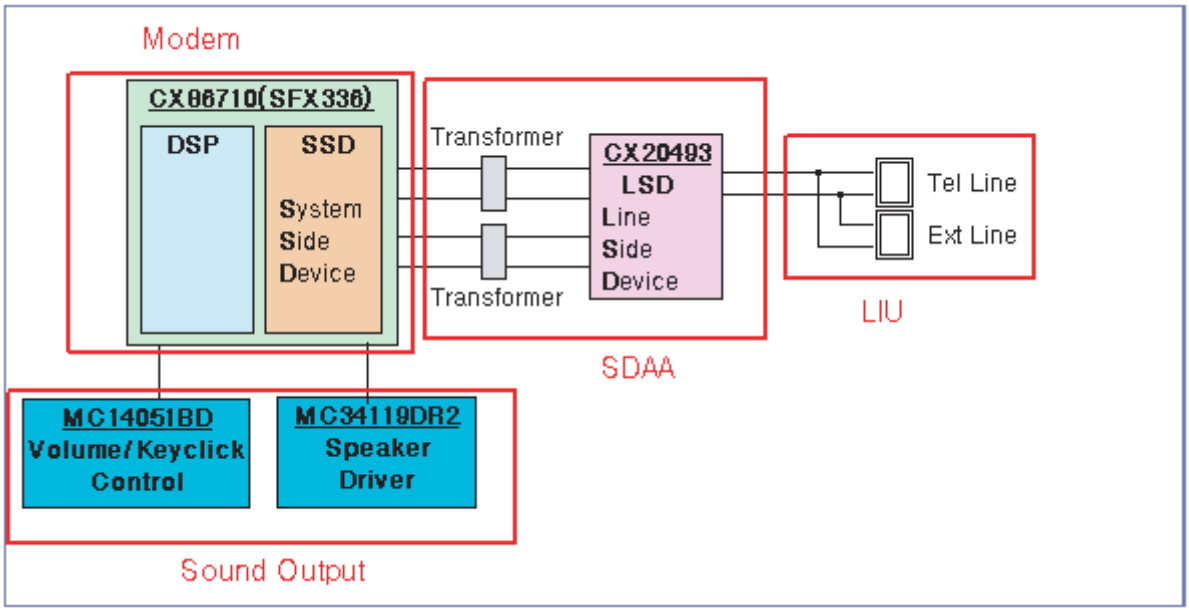
- CIS Supply Voltage : +3.3V
- CIS Max frequency : 5MHz
- CISLinetime
  - Fax/Copy - 1.5ms
  - PC-Scan - 4.5ms
- White output volt. : Max 0.8V

4) ADF Driving Part : Driving ADF Stepper motor, and the maximum motor speed is 2000PPS.
- MOTOR DRIVER : A3978(Allegro)
- Driving Voltage : 24V DC
- Phase : 2-2 Phase 2000PPS at Quick Scan,
  2-2 Phase 1000PPS AT Fine Scan,
  2-2 Phase 667PPS AT Super Fine Scan

3.2.3 FAX Section

Modem Part

BLOCK DIAGRAM



Implemented by based on Conexant DAA (Data Access Arrangement) Solution, and is roughly composed of two kinds Chip Solution

- CX86710 (SFX336): Existing Modem Chip which adds SSD (System Side Device) for interfacing between LSD and DIB of FM336Plus Core

- CX20493 (LSD) : LIU (Line Interface Unit) Chip which is controlled by SSD and satisfies each PSTN Requirements by modulating internal Configuration with connecting Tel Line.

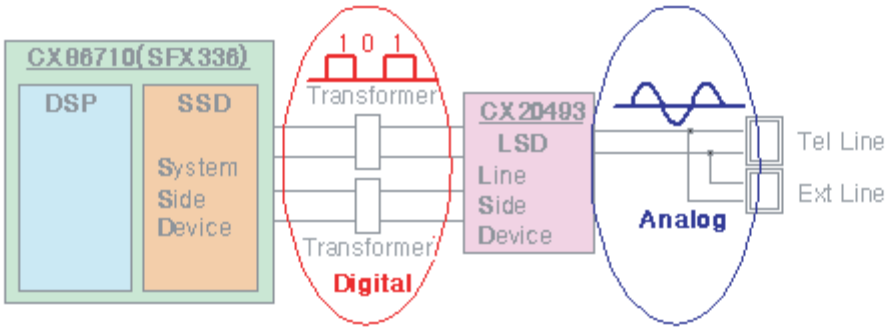
Modem (SFX336) specification.

- 2-wire half-duplex fax modem modes with send and receive data rates up to 33,600 bps
- V.17, V.34, V.29, V.27 ter, and V.21 Channel 2
- Short train option in V.17 and V.27 ter
- PSTN session starting
- V.8 and V.8bis signaling
- HDLC support at all speeds
- Flag generation, 0-bit stuffing, ITU CRC-16 or CRC-32 calculation and generation
- Flag detection, 0-bit deletion, ITU CRC-16 or CRC-32 check sum error detection
- FSK flag pattern detection during high-speed receiving
- Tone modes and features
- Programmable single or dual tone generation
- DTMF receiver
- Tone detection with three programmable tone detectors
- Receive dynamic range:
- 0 dBm to -43 dBm for V.17, V.29, V.27 ter and V.21 Channel 2
- 9dBm to -43 dBm for V.34 half-duplex
- Digital speaker output to monitor received signal
- Two16-byte FIFO data buffers for burst data transfer with extension up to 255 bytes
- V.21 Channel 1Flag detect
- V.21 Channel 1Flag detect
- +3.3V only operation
- Typical power consumption
- Normal mode: 264 mW

Signal Transition of DAA Solution

Line Interface Signal of Tel Line and LSD is Analog Signal.

2) there is A/D, D/A Converter in LSD, so Analog Signal from Tel Line is converted in Digital through A/D Converter in DAA and transfer to SSD by DIB Capacitor
Digital Signal from SSD is converted to Analog by D/A Converter in DAA and transfer to Tel Line



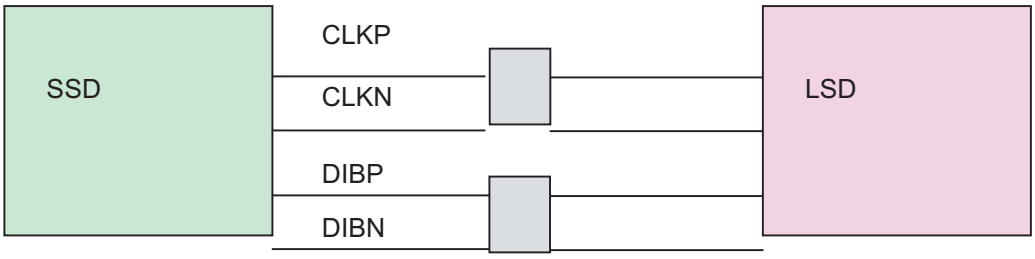
Transformer transfer Clock from SSD to LSD and Clock Frequency is 4.032MHz.

LSD full wave rectifies Clock to use as inner Power supply and also use as Main Clock for DIB Protocol Sync between LSD and SSD. Transformer transfer Clock by separating Primary and Secondary, and
amplifies Clock Level to LSD by Coil Turns Ratio 1:1.16.

■ Clock

- Clock is supplied by transformer from SSD to LSD, and there is PWROUT to adjust output impedance of Clock

Out Driver is inside SSD and CLKSHIGH Resistor to adjust duty of HLPWR Resistor and Clock.



Clock from SSD to LSD has Differential structure of 180 phase difference for Noise Robustness

DIB Data transfer Data from SSD to LSD by Transformer, and also transfer specific data from LSD to SSD.

After transferring data from SSD, RSP is transferred and LSD recognizes RSP and change LSD to output Driver transfer Data to SSD.

DIB Data form SSD to LSD by Transformer has Differential structure of 180 phase difference between DIBP and DIBN for Noise Robustness

3.2.4 Line Interface Part

This is Connection Part between system and PSTN(Public Switched Telephone Network), and primary circuit is usually located. Main functions are Line Interface, Telephone Connection and Line Condition Monitoring.

1 Telephone Line Connection

① Modular Plug : RJ-11C

② LIU PBA Modular Type : 623 PCB4-4

③ Line Code Length : 2500 ± 50mm

④ Line Code Color : Black

ON HOOK state Characteristic

1) DC Resistance

① DP Dial Mode (Direct Current 30mA) : 50 ~ 300ohm

② DTMF Dial Mode (Direct Current 20mA) : 50 ~ 540ohm

2) Ring Sensitivity

① Ring detection Voltage : 40Vrms ~150Vrms (condition :Current=25mA,Frequency=15Hz)
product Margin : 30Vrms ~150Vrms

② Ring detection Frequency : 15.3Hz ~68Hz (condition : Voltage=45Vrms,Current=25mA)
product Margin : 15Hz ~70Hz

③ Ring detection Current : 20mA ~ 100mA (condition : Voltage=40Vrms,Frequency=20Hz)
product Margin : over 15mA

3) False Ring Sound

① Ring Frequency : 750 Hz + 1020 Hz

② Ring interrupt Cycle : On/Off depending on input Ring Signal Cycle.

3.2.5 Printing Process Part

Printing Process part is made of PC-Interface part, PVC(Priter Video Controller), LSU control part, High Voltage control part and Fuser Unit control part. PC-interface core is included in the Chorus2 ASIC and controls the PC-interface. LSU control part controls the LSU polygon motor, Laser diode, video data output so thatthe printing image can be made up on the OPC Drum.

3.2.6 Engine Paper Feeding

1) Feeding Type : MP Cassette Type
2) Feeding Standard : Center Loading
3) Feeding Qty : Cassette 150 sheets (75g/㎡, 20lb paper standard)
4) 1 sheet (Paper, OHP, Envelope etc.)
5) Separating Type: Cassette - Friction Pad Type
6) Manual Tray : 1 sheet
7) Driver Type : Driving by Gearing from Main Motor
8) Pick_up Roller Driver : Solenoid
9) Pick up Roller Rubber Material : EPDM+IR μ=1.3 or more
10) Pick up Velocity : 94.8731mm/Sec (Process : 93.0667mm/sec)
11) Paper detecting Sensor : Photo Sensor
12) Paper Size Sensor : None
13) Paper Separating Pad Material : NBB 52 °, μ=0.8~1.2
14) Separating Pad Pressure : TBD 150 gf
15) Pick_up Roller RPM : 47.683 RPM
16) Feeding Pressure (Same as Transfer Roller)
17) Paper Exit Type : Face Down
18) Feed Roller Force : TBD Kg.f or more.
19) Spring Feed Tensile Force : TBD gf
20) Feed roller Velocity : mm/sec
21) Feed Roller Material
22) Exit Sensor : Photo Sensor

3.3 Develope Process

- Developing Method : Non magnetic 1 element contacting method
- Toner : Non magnetic 1 element shatter type toner
- Toner Qty:35gf /60gf (1k/3k)
- The life span of toner 1k/3k sheets (ISO Standard Coverage)
- Toner Residual Sensor : None
- OPC Cleaning : Use the conventional cleaning blade
- Handling of wasted toner : Discard by collecting waste-toner at waste-toner bin.
- OPC Drum Protecting Shutter : None
- Classifying device for toner cartridge: ID is classified by interruption of the frame channel.
- Development Roller type : conductive elastic roller
- Doctor BLADE Type : Regulating toner layer by pressure
- Charge Roller Type : Conductive Roller Contact-Charge

3.3.1 Fuser Specification

1) Heat Lamp

- Heat Lamp Terminal Shape : Terminal Single Type
- Voltage 120 V : 115 ± 5 %, 220 V : 230 ± 5 %
- Capacity : 750 Watt ± 30 W
- Light Qty Distribution : 140%
- Life : 3000 Hr

2) Thermostat

- Thermostat Type : Non-Contact type THERMOSTAT
- Control Temperature : 150°C ± 5°C

3) Thermistor

- Thermistor Type : HF-R0060 (SEMITEC 364FL Type)
- Temperature Resistance : 7 kΩ(180 °C)
- SYSTEM Temperature SETTING
  - Stand by : 165 ± 5°C
  - Printing : 175 ± 5°C(5 minutes before)
    170°C ± 5°C(5 minutes after)
  - Overshoot: 200°C or less
  - Overheat :210°C or less

4) Safety Relevant Facts

- Protecting device when overheating
  - 1st protecting device : H/W cuts off when detecting an overheating
  - 2st protecting device : S/W cuts off when detecting overheating
  - 3st protecting device : Thermostat cuts off the power
- Safety device
  - The power of Fuser is cut-off after front cover is open.
  - The overheating safety device for customer
  - The surface temperature of the Fuser Cover is under 80°C

3.4 Sanner Part

600dpi Color CIS Module for Flat bed, SCX-4725FN uses the CIS scanning method

1) CIS SPEC
- Scanning size : 216 mm (width for letter-size)
- Light source : LED
- Scanning sensor: CIS 600/300 dpi
- Scanning mode : Color SCAN / Mono SCAN
- MTF : 30% (300 dpi Chart)
- CIS interface : Analog output
- Power supply : 3.3V
- Clock Frequency: 5.5MHz max.
- Number of output : 1
- LED Current : Green/Blue : 50mA, Red : 60mA
- Clamp Level : 1.4V
- Connection : 12 pin FFC connector (pitch 1.0mm)

2) Scan Resolution

(a) Transmission
- Normal : Vertial: 3.85 Line/mm, Horizontal: 8 Pels/mm :203 x 98dpi
- Fine : Vertial: 7.7 Line/mm, Horizontal: 8 Pels/mm :203 x 196dpi
- Super Fine : Vertial: 11.8 Line/mm, Horizontal: 11.8 Pels/mm ;300 x 300dpi

(b) When Copy : Vertial: 11.8 Line/mm, Horizontal: 23.6 Pels/mm :600x300dpi(ADF)
Vertial: 23.6 Line/mm, Horizontal: 23.6 Pels/mm :600x600dpi(Platen)

3) Half Tone (Gray Scale) : 256 Levels

4) Scan Line Time

(a) Tx
- Normal : 1.5 ms/Line
- Fine : 1.5 ms/Line
- Super Fine : 1.5 ms/Line

(b) Copy : 1.5 ms/Line

(c) Scan
- Color : 4.5msec/line
- Gray : 4.5msec/line
- Mono : 4.5msec/line

5) Scanning Width
- MAX SCAN WIDTH : 216 mm (8.5 inches)
- Effective Scan Width: 208mm

6) ADF Motor

(a) Motor Spec
- 정격전압 : 24VDC
- 정격전류 : 0.6A(Peak)

7) Motor Driver speed & method
(a) FAX Transmission
- Normal Mode : 2000 pps, 2-2
- Fine Mode : 1000 pps, 2-2
- Super Fine Mode : 667 pps, 2-2

(b) Copy Job : 667 pps, 2-2
- max(30sheets) : 50gf
- min(1sheets) : 20gf

8) Document Detect sensor
(a) Type : Photo interrupt
(b) Position : ADF PBA
(c) LED - max current : 30mA
- max voltage : 3.3V

(d) Output - Logic "H" : No Paper
- Logic "L" : Paper

(e) Lever-Sensor DOC : ADF Lower Torsion Spring

9) Regi Detect sensor
(a) Type : Photo interrupt
(b) Position : ADF PBA
(c) LED - max current : 50mA
- max voltage : 3.3V

(d) Output - Logic "H" : No Paper
- Logic "L" : Paper

(e) Lever-Sensor DOC : ADF Lower Torsion Spring

10) Document Scan sensor
(a) Type : Photo interrupt
(b) Position : ADF PBA
(c) LED : - Max current : 50mA
- Max Voltage : 3.3V

(d) Output - Logic "H" : Off(No Position), No Paper
- Logic "L" : On (Doc Position), Paper

(e) LEVER - SENSOR SCAN : Scan Lower Torsion Spring

3.5 OPE(Operational Panel Equipment)

1) Ope Panel

OPE Panel has a MICOM Chip on it and communicates with Main CPU using Serial communication Line(SIO). OPE Panel consists of Micom, Key Matrix Part, LED Driving Part and LCD Part.

2) Key Description

No	Part	Feature	Function
1	Common	3*4Key	Dialing and Option Input
		Start	Starting Fax/Copy Job
		Stop/Clear	Cancel Current Job/Return to default
		Menu	Option select
		Upper Level	Return to upper level menu
		Enter	Option select/Execute
		▶	Next menu or Next option item
		◀	Previous menu or Previous option item
2	Save	Toner Save	TONER SAVE MODE select
3	Copy	Reduce/Enlarge	Select ZOOM ratio when copy
		No.of Copies	Select the number of copies
		Original Type	Change Copy Modes(Text,Text/Photo,Photo)
		Darkness	Change the Darkness of the Copied image (Light/Normal/Dark)
		Favorite Copy	Select one of the predefined Copy templates.
4	Fax	Resolution	STANDARD>FINE>SUPER FINE>PHOTO>COLOR
		Phone Book	Search the user defined Phone number.
		Broadcasting	When sending FAX data to many place in the same time.
		On Hook Dial	On Hook Dial
		Redial / Pause	Last number Redial / Pause
5	Scan	Scan to	select [scan to PC], [scan to FAX], [scan to E-mail] function.

3) LCD Part

- Number of Characters : 16 Characters x 2 line
  - · Clock, Date display
  - · System Status display
  - · Alarm, Error Message display
  - · Function Dialog Message display

3.6 SMPS & HVPS

It is the power source of entire system. It is assembled by an independent module, so it is possible to use for common use. It is mounted at back of the machine. Power part is divided by two independent PBAs - SMPS PBA and HVPS PBA. SMPS PBA supplies the DC power for driving the system and supplies the AC power to the fuser. SMPS has two output channels : +5V and +24V. HVPS PBA supplies High voltage to the developer part to make a printing image on the paper. High voltages applied to the MHV, THV, DEV, SUPPLY.

3.6.1 SMPS

1) AC Input

- Input Rated Voltage : AC 220V ~ 240V / AC 110V ~ 127V
- Input Voltage fluctuating range: AC 180V ~ 270V / AC 100V ~ 135V
- Rated Frequency : 50/60 Hz
- Frequency fluctuating range : 47 ~ 63 Hz
- Input Current : Under 4.0Arms / 2.5Arms
  (But, the status when lamp is off or rated voltage is inputted/outputted)

2) Rated Output Power

NO	Items	CH1	CH2	Remarks
1	CHANNEL	+5V	+24.0V	
2	CONNECTOR PIN	CON 2 5V PIN : #5pin GND PIN: #6pin	CON 2 24V PIN: #2, #3, #4 GND PIN: #7pin	Jam cover switch included
3	Rated Output	+5V ± 5%(4.75 ~ 5.25V)	+24V -10%/+15%(21.6V ~ 27.6V)	
4	Max. Output current	0.8 A	2.5 A	
5	Peak Loading current	1.0 A	2.7 A	within 1ms Duration
6	RIPPLE NOISE Voltage	100mVp-p or less	500mVp-p or less	
7	Maximum output	2.5W	36W	
8	Peak output	4W	55.2W	1ms
9	Protection for loading shortage and overflowing current	Fuse Protection or Shutdown within 1.5A ~ 3.0A range.	Fuse Protection or Shutdown within 3.5A ~ 4.5A range.	

3) Consumption Power

NO	Item	CH1(+5V)	CH2(24V)	System
1	Stand-By	0.6 A	1.3 A	AVG : 70Wh
2	Printing	0.8 A	1.9 A	AVG : 400Wh
3	Sleep-Mode	0.5 A	0.3 A	AVG : 12Wh

4) Power Cord Length : 1830 ±50mm
5) Power Cord Switch : Exist
6) Feature
- Withstand Resistance : 100 ㏁ or more (at DC 500V)
- Insulating revisiting pressure : Must be no problem within 1 min. (at1000Vac,10mA)
- Leaking Current : under 3.5mA
- Running Current : under 40A PEAK (AT 25 °C,COLDSTART)
under 50A PEAK (In other conditions)
- Rising Time : within 2Sec
- FallingTime : over 20ms
- Surge : Ring Wave 6KV-500A (Normal, Common)

7) Environment Condition
- Operating temperature range : 0 °C ~ 40 °C
- Maintaining temperature range : -20 °C ~ 40 °C
- Preserving Humidity Condition : 10% ~ 90% RH
- Operating atmospheric pressure range : 1atm

8) EMI Requirement : CISPR, FCC, CE, MIC,
9) Safety Requirement : IEC950 UL1950, CSA950, C-UL, Semko, EK, CB, CCC(CCIB),GOST, EPA,

3.6.2 HVPS Board

The HVPS board creates the high voltage of THV/MHV/Supply/Dev and supplies them to the developer part for making best quality printing image. The HVPS part takes the 24V and outputs the high voltage such as THV/MHV/Supply/Dev, and the outputted high voltage is supplied to the toner, OPC cartridge, and transfer roller.

(a) Transfer High Voltage (THV+)
- Input Voltage : 24 V DC +15% / -10% (21.6V~27.6V)
- Out Voltage : +1300KV ±1.5% (200㏁ Load)
- Out Voltage Trigger : 6.5 ㎂
- Input Voltage Variation : ±5 %
Load Variation : ±5 %
- Out Voltage Rising Time : 100 ms Max
- Out VoltageFalling Time : 100 ms Max
- Transfer Variation Voltage on Environment Variation : +500 V ~ +5000V
- Control Method on environment : THV-PWM ACTIVE, transfer Active signal, of environment sensing voltage is input and get feed back current, and recalculate it to resistance .
- Control method on transfer output voltage : It is controlled by changing its duty of THVPWM Signal as follows. 10% Duty : +500V, 90% Duty : +5000V

(b) Charge Voltage (MHV)
- Input Voltage : 24 V DC +15% / -10% (21.6V~27.6V)
- Out Voltage : -1300KV ±50V(50㏁ Load)
- Out Voltage Rising Time : 50 ms Max
- Out VoltageFalling Time : 50msMax
- Out Voltage Range : 30 ㏁ ~ 1000㏁
- Output Control Signal(MHV-PWM) : Active Low PWM signal for controlling MHV

(c)Developing Voltage (DEV)

- Input Voltage : 24V DC +15% / -10% (21.6V~27.6V)
- Output Voltage: -350V ± 20V (50 ㏁Load)
- Output Voltage Fluctuation range: PWM Control
- Input contrast of the output stability degree : ±5 %orless
- Loading contrast : ±5 %orless
- Output Voltage Rising Time : 50 ms Max
- Output Voltage Falling Time : 50 ms Max
- Output Loading range : 10㏁~1000 ㏁
- Output Control Signal (BIAS-PWM) : Active Low PWM signal for controlling MHV

(d) Supply

- Output Voltage : -550V ± 50V(50㏁ Load)
- Input contrast of the output stability degree : under ±5 %
- Loading contrast : ±5 %orless
- Output Voltage Rising Time : 50 ms Max
- Output Voltage Falling Time : 50 ms Max
- Output Loading range : 10 ㏁ ~ 1000 ㏁
- Output Control Signal (BIAS-PWM) : Active Low PWM signal for controlling MHV

3.7 FUSER AC POWER CONTROL

The Fuser(HEAT LAMP) gets heat from AC power. The AC power controls the switch with the Triac, a semiconductor switch. The 'ON/OFF control' is operated when the gate of the Triac is turned on/off by Phototriac (insulting part). In other words, the AC control part is passive circuit, so it turns the heater on/off with taking signal from engine control part.

When the 'HEATERON' signal is turned on at engine,the LED of PC102 (Photo Triac) takes the voltage and flashes. From the flashing light, the Triac part (light receiving part) takes the voltage,and the voltage is supplied to the gate of Triac and flows into the Triac. As a result, the AC current flows in the heat lamp, and heat is occurred.

On the other hand, when the signal is off, the PC102 is off, the voltage is cut off at the gate of Triac, the Triac becomes off, and then the heat lamp is turned off.

1) Triac feature : 16A, 600V SWITCHING

2) Phototriac Coupler (PC102)

- Turn OnIf Current : 15mA~50mA(Design : 16mA)
- High Repetive Peak Off State Voltage : Min 600V

4. Alignment and Adjustments

4.1 User Mode

The table below shows the map of User settings available in User Mode. These are fully described in the User Guide and are not included here.

1st level			2nd level	3rd level	Default Value
RETURN ◀--			RETURN		
left/right && Enter -- ▶		14 character	left/right && Enter		
1. Paper Setting ◀ Paper Type ▶	1	Paper Type	Plain Paper, Thick, Thin, Bond, Colored, Card stock, Labels, Transparency, Envelope, Preprinted		Plain Paper
	2	Paper Size	A4, Legal, Executive, Folio A5, B5, A6, Letter		By Country
2.Machine Setup ◀ Machine ID ▶	1	Machine ID (Only SCX-4521F)	Fax:		
			ID:		
	2	Date & Time (only SCX-4521F)	00-00-0000 00:00(AM)		
	3	Clock Mode (only SCX-4521F)	12, 24 hours		12hours
	4	Language	[English/FRANCAIS/Espanol/ Portugues/Deutsch/Italiano/ Pycckn/Norsk/Polski/Suomi/ Magyar/Dansk/Solvencina cestina/Svenska/Turkse - 16 language		English
	5	Power Save	On	5, 10, 15, 30, 45 min.	5
			Off		
	6	Ignore Toner	On		
			Off		
	7	Select Country			

1st level			2nd level	3rd level	Default Value
RETURN ◀--			RETURN		
left/right && Enter --▶		14 character	left/right && Enter		
3.Copy Setup ◀ Default-Change ▶	1	Default-Change	Darkness	Light/Normal/Dark	Normal
			Original Type	Text, Text/Photo, Photo	Text
			Reduce/Enlarge	[Original(100%)]	100%
				[LGL→LTR(78%)]	
				[LGL→A4(83%)]	
				[A4→A5](71%)]	
				[A4→LTR(94%)]	
				[EXE→LTR(104%)]	
				[A5→A4](141%)]	
				25%	
				50%	
				150%	
				200%	
				400%	
				[Custom:25-400]	
			No. of Copies	[1-99]	1
	2	Timeout	Off. 15,30,60,120Sec, Off		30sec
4. Fax Setup	1	Receive Mode	Fax, Tel, Ans/Fax		
(only SCX-4725FN)	2	Ring to Answer	1~7		2
◀ Receive Mode ▶	3	Darkness	Light/Normal/Dark		Normal
	4	Redial Term	1~15Min		3minutes
	5	Redials	1~13times		2times
	6	MSG Confirm	On, Off, On-Error		On-Error
	7	Image TCR	On, Off		
	8	Auto Report	On, Off		On
	9	Auto Reduction	On, Off		On
	10	Discard Size	0~30mm		20mm
	11	RCV Start Code	0~9		*9*
	12	DRPD Mode	set		
5. Fax Feature	1	Delay Fax	Enter Number		
◀ Delay Fax ▶	2	Priority Fax	Enter Number		
	3	Add Page	Operation Not Assigned		
	4	Cancel Job	Operation Not Assigned		
6. Advanced fax	1	Toll Save	On,Off	Start Time/ End Time	Off
◀ Toll Save ▶	2	Junk Fax Setup	On	Fax:	
			Off		Off
	3	Secure Receive	On,Off, Print		Off
	4	Prefix Dial	FAX: xxxxx (5 digits)		
	5	Stamp RCV Name	On, Off		Off
	6	ECM Mode	On, Off		On
7. Reports	1	Phone Book			
◀ Phone Book ▶	2	Sent Report			
	3	RCV Report			
	4	System Data			
	5	Scheduled Jobs			
	6	MSG Confirm			
	7	Junk Fax List	10 ea		

<continue..>

1st level			2nd level	3rd level	Default Value
RETURN ◀--			RETURN		
left/right && Enter -- ▶		14 character	left/right && Enter		
8. Network Setup (only SCX-4725FN) ◀ Reset Network ▶	1	Reset Network	Yes, No		
	2	Config Network	TCP/IP, Ether Talk	Manual, DHCP, BOOTP	
	3	Set to Default	Yes, No		
	4	Print Net CFG	Yes, No		
9. Sound/Volume ◀ Speaker ▶	1	Speaker	On, Off, Comm.		Comm.
	2	Ringer	Off, Low,Med,High		Med
	3	Key Sound	On, Off		Off
	4	Alarm Sound	On, Off		On
0. Maintenance ◀ Clean Drum ▶	1	Clean Drum	Yes, No		Off
	2	Auto Cleaning	On, Off		Off
	3	Notify Toner	All Settings		Off
	4	Clear Memory	Clear All Mem.		
			Paper setting		
			Copy Setup		
			Fax Setup		
			Fax Feature		
			Advanced Fax		
			Sent Report		
			RCV Report		
			Phone Book		

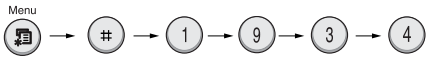
4.2 Tech Mode and Setting

4.2.1 How to Enter Tech Mode

In service (tech) mode the technician can check the machine and perform various tests to help with failure diagnosis.

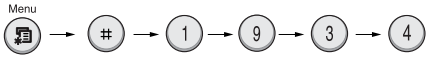
When in Tech mode the machine still performs all normal operations.

To enter the Tech mode (SCX-4725FN)

To enter the Tech mode press 

in sequence and the LCD briefly displays **'TECH',** the machine has entered service (tech) mode.

To enter the Tech mode (SCX-4725F)

To enter the Tech mode press 

in sequence and the LCD briefly displays **'TECH',** the machine has entered service (tech) mode.

4.2.2 Setting-up System in Tech Mode

1st level			2nd level	3rd level	Default Value
RETURN ◀--			RETURN		
left/right && Enter --▶		14 character	left/right && Enter		
Tech Mode ◀ Data Setup ▶	1	Data Setup	Send Level	09-15	-12
			Modem Speed	33.6, 28.8, 14.4, 12.0, 9.6, 4.8	33.6
			Error Rate	5%, 10%	10%
			Notify Toner	Customer No.	
				Customer Name	
				Service No.	
				Serial No.	
			Clear All Mem.	Select Country	
			Clear Count	Enter Password [∗ ∗ ∗ ∗]	
			Flash Upgrade	Local	
			Silence Time	Off/ 12 Sec/Unlimited	Off
			Ignore Toner	On, Off	Off
			Test Param Set	00-50	55
	2	Machine Test	Switch Test		
			Modem Test		
			Dram Test		
			Rom Test		
			Pattern Test		
			Shading Test		
	3	Report	Protocol		
			System Data		
			Error Info		

4.2.3 Setting

4.2.3.1 Changing the Display Language

To change the language that displays on the control panel, follow these steps:

1. Press Menu until “Machine Setup” appears on the top line of the display.
2. Press the scroll button (◀ or ▶) until “Language” appears on the bottom line of the display.
3. Press Enter. The current setting appears on the bottom line of the display.
4. Press the scroll button (◀ or ▶) until the language you want appears on the display.
5. Press Enter to save the selection.
6. To return to Standby mode, press Stop/Clear.

4.2.3.2 Setting the Machine ID

In some countries, you are required by law to indicate your fax number on any fax you send. The Machine ID, containing your telephone number and name (or company name), will be printed at the top of each page sent from your machine.

1. Press Menu until “Machine Setup” appears on the top line of the display. The first available menu item, “Machine ID,” displays on the bottom line.
2. Press Enter. The display asks you to enter the fax number.
   If there is a number already set, the number appears.
3. Enter your fax number using the number keypad.

NOTE: If you make a mistake while entering numbers, press the ◀ button to delete the last digit.

4. Press Enter when the number on the display is correct. The display asks you to enter an ID.
5. Enter your name or the company name using the number keypad.
   You can enter alphanumeric characters using the number keypad, and include special symbols by pressing the 0 button.
   For details on how to use the number keypad to enter alphanumeric characters.
   If you want to enter the same letter or number in succession, enter one digit, move the cursor by pressing the ▶ button and enter the next digit.
   If you want to insert a space in the name, you can also use the ▶ button to move the cursor to skip the position.
6. Press Enter when the name on the display is correct.
7. To return to Standby mode, press Stop/Clear.

4.2.3.3 Setting the Date and Time

When you turn your machine on for the first time, the display prompts you to enter the current date and time. After entering, it will not appear anymore. For the SCX-4725FN, all of your faxes will have the date and time printed on them.

NOTE: If power to the machine is cut off, you need to reset the correct time and date once the power has been restored.

1. Press Menu until “Machine Setup” appears on the top line of the display.
2. Press the scroll button (◀ or ▶) to display “Date & Time” on the bottom line and press Enter.
3. Enter the correct time and date using the number keypad.
   For the SCX-4725, press the scroll button (◀ or ▶) to enter the time and date.

   Month = 01 ~ 12

   Day = 01 ~ 31

   Year = requires four digits

   Hour = 01 ~ 12 (12-hour mode)

   00 ~ 23 (24-hour mode)

   Minute = 00 ~ 59

NOTE: The date format may differ from country to country.

   You can also use the scroll button (◀ or ▶) to move the cursor under the digit you want to correct and enter a new number. For the SCX-4725, you can use Enter or Upper Level to move the cursor.
4. To sel ect “ AM” or “PM” for 12-hour format, press the * or # button or any number button.
   For the SCX-4725, press Enter and then the scroll button (◀ or ▶).
   When the cursor is not under the AM or PM indicator, pressing the * or # button immediately moves the cursor to the indicator. For the SCX-4725, press the scroll button (◀ or ▶) to move the cursor to the indicator.
   You can change the clock mode to 24-hour format (e.g. 01:00 PM as 13:00).
5. Press Enter when the time and date on the display is correct.
   When you enter a wrong number, the machine beeps and does not proceed to the next step. If this happens, just reenter the correct number.
6. To return to Standby mode, press Stop/Clear.

4.2.3.4 Changing the Clock Mode

You can set your machine to display the current time using either a 12-hour or 24-hour format.

1. Press Menu until “Machine Setup” appears on the top line of the display.
2. Press the scroll button (◀ or ▶) until you see “Clock Mode” on the bottom line and press Enter.
   The clock mode currently set for the machine displays.
3. Press the scroll button (◀ or ▶) to select the other mode and then press Enter to save the selection.
4. To return to Standby mode, press Stop/Clear.

4.2.3.5 Setting the Paper Size and Type

After loading paper in the tray, you need to set the paper size and type using the control panel buttons. These settings will apply to copy and fax modes. For PC-printing, you need to select the paper size and type in the application program you use on your PC.

1. Press Menu.
   The display shows “Paper Setting” on the top line of the display.
2. Press the scroll button (◀ or ▶) to display “Paper Size” on the bottom line and press Enter to access the menu item.
3. Use the scroll button (◀ or ▶) to find the paper size you are using and press Enter to save it.
4. Press the button to scroll to “Paper Type” and press Enter to access the menu item.
5. Use the scroll button (◀ or ▶) to find the paper type you are using and press Enter to save it.
6. To return to Standby mode, press Stop/Clear.

4.2.3.6 Setting Sounds

You can control the following sounds:

- Speaker: You can turn on or off the sounds from the telephone line through the speaker, such as the dial tone or a fax tone. With this option set to “Comm.” the speaker is on until the remote machine answers.
- Ringer: You can adjust the ringer volume.
- Key Sound: With this option set to “On” a key tone sounds each time a key is pressed.
- Alarm Sound: You can turn the alarm sound on or off. With this option set to “On” an alarm tone sounds when an error occurs or fax communication ends.
- You can adjust the volume level using the On Hook Dial button.

4.2.3.7 Speaker, Ringer, Key Sound, and Alarm Sound

1. Press Menu until “Sound/Volume” appears on the top line of the display.
2. Press the scroll button (◀ or ▶) to scroll through the options. Press Enter when you see the desired sound option.
3. Press the scroll button (◀ or ▶) to display the desired status or volume for the option you have selected. You will see the selection on the bottom line of the display. For the ringer volume, you can select “Off,” “Low,” “Med,” and “High”. Setting “Off” means that the ringer does not sound. The machine works normally even if the ringer is turned off.
4. Press Enter to save the selection. The next sound option appears.
5. If necessary, repeat steps 2 through 4.
6. To return to Standby mode, press Stop/Clear.

4.2.3.8 Speaker Volume

1. Press On Hook Dial. A dial tone sounds from the speaker.
2. Press the scroll button (◀ or ▶) until you hear the volume you want. The display shows the current volume level.
3. Press On Hook Dial to save the change and return to Standby mode.

NOTE: You can adjust the speaker volume only when the telephone line is connected.

4.2.3.9 Toner Save Mode

Toner Save mode allows your machine to use less toner on each page. Activating this mode extends the life of the toner cartridge beyond what one would experience in the normal mode, but it reduces print quality.

To turn the toner save mode on or off, press Toner Save.

• If the button backlight is on, the mode is active and the machine uses less toner when printing a document.

• If the button backlight is off, the mode is deactivated and the machine prints with the normal quantity of toner.

4.2.3.10 Power Save Mode

Power Save mode allows your machine to reduce power consumption when it is not in actual use. You can turn this mode on and select a length of time for which the machine waits after a job is printed before it switches to a reduced power state.

1. Press Menu until “Machine Setup” appears on top line of the display.
2. Press the scroll button (◀ or ▶) until “Power Save” appears on the bottom line. Press Enter.
3. Press the scroll button (◀ or ▶) to display “On” on the bottom line and press Enter.
   Selecting “Off” means that the power save mode is deactivated.
4. Press the scroll button (◀ or ▶) until the time setting you want appears.
   The available options are 5, 10, 15, 30, 60 and 120 (minutes).
5. Press Enter to save the selection.
6. To return to Standby mode, press Stop/Clear.

4.2.4 FLASH UPGRADE

There are 2 methods to update the Flash Rom, Local and Remote.

(1) Local Machine

• RCP (Remote Control Panel) mode

This method is for Parallel Port or USB Port. Connect the PC and activate the RCP (Remote Control Panel) to upgrade the Firmware.

< Method >

How to Update Firmware using RCP

1. Connect PC and Printer with a Parallel Cable or a USB Cable.
2. Run the RCP utility and select Firmware Update.
3. Search for the Firmware file to be used to update the set using the Browse Icon.
4. Click the Update icon. The firmware file is transmitted to the Printer automatically and the printer is initialized when the download completes.
5. Click the Refresh icon and check that the updated version numbers are displayed.

• DOS Command mode

This method is ONLY for Parallel Port. Connect the PC to the set using a Parallel Cable and enter the DOS Command to upgrade the firmware.

< Method >

1. First of all you need the following files : down.bat, down_com.bin, fprt.exe, and Rom File: (file name for upgrade). Ensure you save ALL of these files in the same folder.
2. At the DOS prompt enter the correct command (as shown below) and push the enter key. Then the upgrade will automatically take place..
3. There are two commands use the correct one depending on the condition of the set..
   * When the product is in the idle condition
     down "rom file"
   * When the product is in Ready condition
     (TECH MODE --> DATA SETUP --> FLASH UPGRADE --> LOCAL)
     copy/b "rom file" lpt1
4. Do not turn off the power during the upgrade process.

(2) Remote FAX

It is possible to use a set that already has the latest firmware to upgrade a remote set remotely using the telephone system.

< Method >

1. On the set that has the latest firmware set it toi transmit the upgrade:-
   (TECH MODE •DATA SETUP•••• FLASH UPGRADE•••• REMOTE)
2. Enter the telephone number of the set that needs to be upgraded.
   (Several faxes can be upgrade at the same time. In this case, enter each fax number.)
3. When the enter button is pressed the set sends the firmware file by calling designated fax number.
   (Around 10~15 minutes are needed to send the file.)

< Caution >

1. The Sending and Receiving fax machines MUST be the same model.
2. The sending fax must be set up in ECM mode and the Receiving fax memory must be 100%.
   If not the function will not work.

4.2.5 Machine Test

SWITCH TEST

Use this feature to test all keys on the operation control panel. The result is displayed on the LCD window each time you press a key.

MODEM TEST

Use this feature to hear various transmission signals to the telephone line from the modem and to check the modem, amplifier and speaker. If no transmission signal sound is heard, it means the modem part of the main board, amplifier, speaker or speaker harness is faulty.

DRAM TEST

Use this feature to test the machine's DRAM. The result appears in the LCD display.
If all memory is working normally, the LCD shows << O K >>

ROM TEST

Use this feature to test the machine's ROM. The result and the software version appear in the LCD display.

- FLASH VER : 1.00 V
- ENGINE VER :1.00V

PATTERN TEST

Using this pattern printout you can check that the printer mechanism is functioning properly.
This function is for factory manufacturing use only.

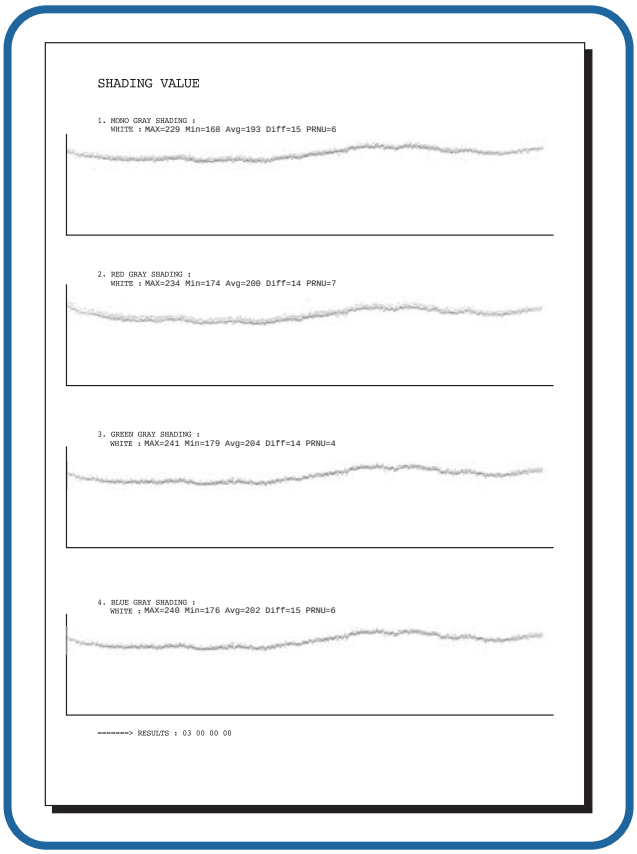
SHADING TEST

The function is used to set the optimum scan quality determined by the specific characteristics of the CIS(Contact Image Sensor). If copy image quality is poor perform this function to check the condition of the CIS unit.

< Method >

1. Select the [Shading Test] in TECH MODE (Menu, #, 1934).
2. Push the ENTER button and an image will be scanned.
3. After scanning the CIS SHADING PROFILE will be print out.
4. If the printed image is different to the sample image shown the CIS is defective.

NOTICE : *When you test the CIS, make sure that the cover is closed.*


SHADING VALUE
1. MONO GRAY SHADING :
WHITE : MAX=229 Min=168 Avg=193 Diff=15 PRNU=6
2. RED GRAY SHADING :
WHITE : MAX=234 Min=174 Avg=200 Diff=14 PRNU=7
3. GREEN GRAY SHADING :
WHITE : MAX=241 Min=179 Avg=204 Diff=14 PRNU=4
4. BLUE GRAY SHADING :
WHITE : MAX=240 Min=176 Avg=202 Diff=15 PRNU=6
-------> RESULTS : 03 00 00 00

4.2.6 Report

PROTOCOL LIST

This list shows the sequence of the CCITT group 3 T.30 protocol during the most recent sending or receiving operation. Use this list to check for send and receive errors. If

SYSTEM DATA

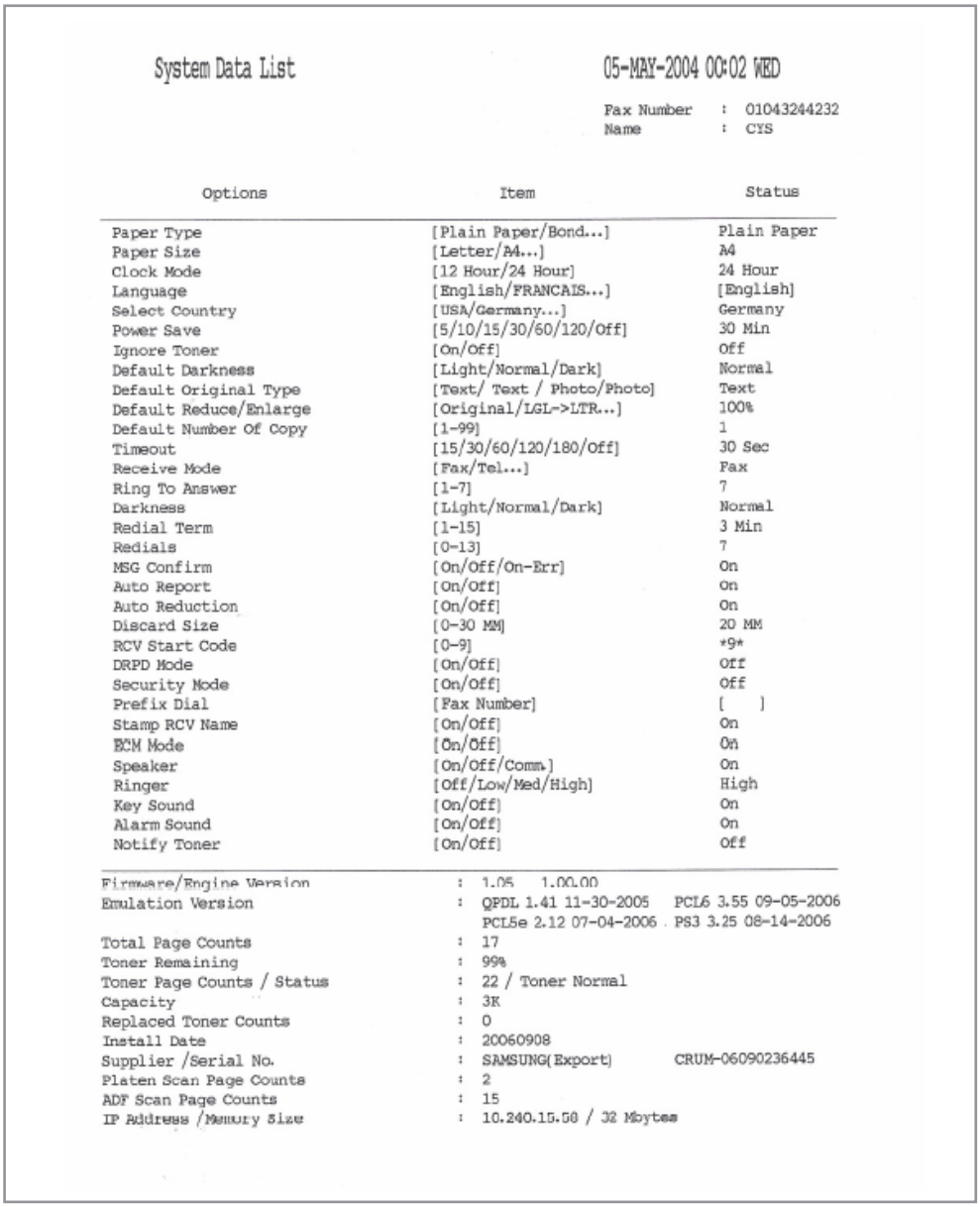
This list provides a list of the user system data settings and tech mode settings.

KEY HISTORY

This list shows th input key history.

ERROR INFO

This list display the detail machine error list.



System Data List 05-MAY-2004 00:02 WED

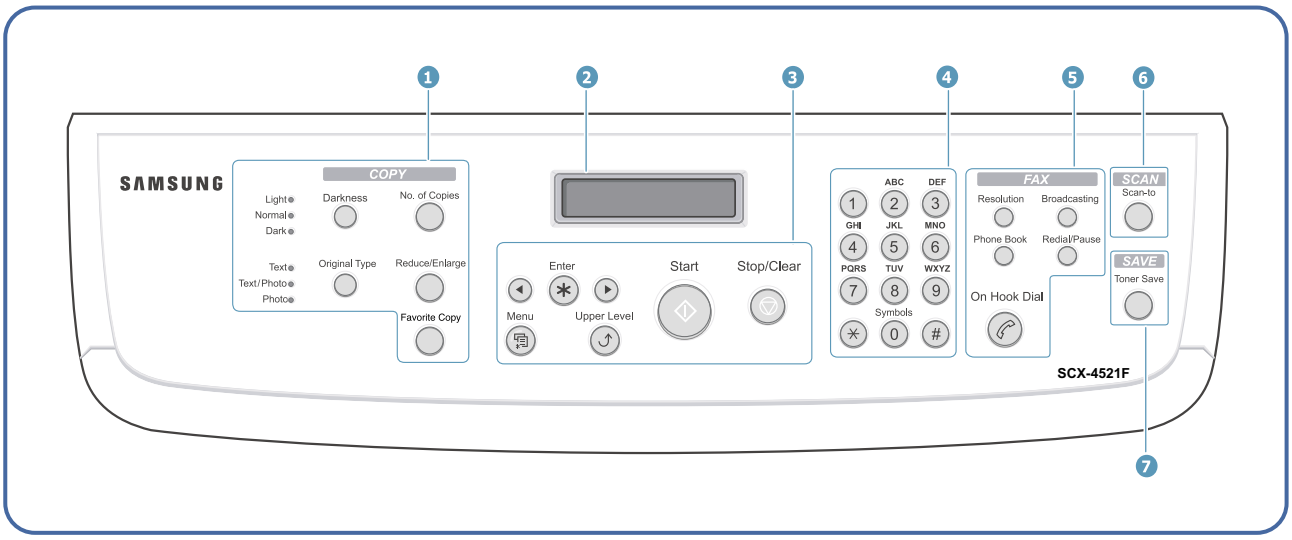
Fax Number : 01043244232
Name : CYS

Options	Item	Status
Paper Type	[Plain Paper/Bond...]	Plain Paper
Paper Size	[Letter/A4...]	A4
Clock Mode	[12 Hour/24 Hour]	24 Hour
Language	[English/FRANCAIS...]	[English]
Select Country	[USA/Germany...]	Germany
Power Save	[5/10/15/30/60/120/Off]	30 Min
Ignore Toner	[On/Off]	Off
Default Darkness	[Light/Normal/Dark]	Normal
Default Original Type	[Text/ Text / Photo/Photo]	Text
Default Reduce/Enlarge	[Original/LGL->LTR...]	100%
Default Number Of Copy	[1-99]	1
Timeout	[15/30/60/120/180/Off]	30 Sec
Receive Mode	[Fax/Tel...]	Fax
Ring To Answer	[1-7]	7
Darkness	[Light/Normal/Dark]	Normal
Redial Term	[1-15]	3 Min
Redials	[0-13]	7
MSG Confirm	[On/Off/On-Err]	On
Auto Report	[On/Off]	On
Auto Reduction	[On/Off]	On
Discard Size	[0-30 MM]	20 MM
RCV Start Code	[0-9]	*9*
DRPD Mode	[On/Off]	Off
Security Mode	[On/Off]	Off
Prefix Dial	[Fax Number]	[ ]
Stamp RCV Name	[On/Off]	On
ECM Mode	[On/Off]	On
Speaker	[On/Off/Comm.]	On
Ringer	[Off/Low/Med/High]	High
Key Sound	[On/Off]	On
Alarm Sound	[On/Off]	On
Notify Toner	[On/Off]	Off

Firmware/Engine Version	: 1.05 1.00.00	
Emulation Version	: QPDL 1.41 11-30-2005	PCL6 3.55 09-05-2006
	PCL5e 2.12 07-04-2006	PS3 3.25 08-14-2006
Total Page Counts	: 17	
Toner Remaining	: 99%	
Toner Page Counts / Status	: 22 / Toner Normal	
Capacity	: 3K	
Replaced Toner Counts	: 0	
Install Date	: 20060908	
Supplier /Serial No.	: SAMSUNG(Export)	CRUM-06090236445
Platen Scan Page Counts	: 2	
ADF Scan Page Counts	: 15	
IP Address /Memory Size	: 10.240.15.50 / 32 Mbytes	

4.3 Control Panel

4.3.1 Control Panel Functions



① COPY	**Darkness**	Adjusts the brightness of the documents for the current copy job.
	Original Type	Selects the document type for the current copy job.
	No. of Copies	Selects the number of copies.
	Reduce/Enlarge	Makes a copy smaller or larger than the original.
	Favorite Copy	Allows you to use one of the special copy features, such as Clone, Copy Collate, Autofit, ID Card Copy, 2/4 Up and Poster.
②		Displays the current status and prompts during an operation.
③		Uses to scroll through the available options for the selected menu item.
	Enter	Confirms the selection on the display.
	Menu	Enters Menu mode and scrolls through the menus available.
	Upper Level	Sends you back to the upper menu level.
	Start	Starts a job.
	Stop/Clear	Stops an operation at any time. In Standby mode, clears/cancels the copy options, such as the darkness, the document type setting, the copy size, and the number of copies.
④	**Number Keypad**	Dials a number or enters alphanumeric characters.

[Reperence] This Model is Test page not Support.

⑤ FAX	**Resolution**	Adjusts the resolution of the documents for the current fax job.
	Broadcasting	Allows you to send a fax to multiple destinations.
	Phone Book	Allows you to store frequently-dialed fax numbers as one or two-digit speed dial or group dial numbers for automatic dialing and edit the stored numbers. Also allows you to print a Phonebook list.
	Redial/Pause	In Standby mode, redials the last number or in Edit mode, inserts a pause into a fax number.
	On Hook Dial	Engages the telephone line.
⑥ SCAN	**Scan-to**	Allows you to access a list of your PC software programs that an image can be scanned to. You must create the scan list using the Samsung software (Printer Settings Utility) provided with this machine. For details, see **Software User's Guide**.
⑦ SAVE	**Toner Save**	Allows you to save on toner by using less toner to print a document.

4.4 LCD Status Error Messages

STATUS	LCD Display	Descriptions
Document Jam	Document Jam	When Document Jam occurred at ADF module. This is displayed on LCD, Print in the Transmission Journal.
Door Open or Jam Cover Open	[Front or Rear] [Cover Open]	When machine' front side cover or Jam Cover was opened, it displayed On the LCD.
NO paper	[No Paper] Add Paper	When there is no paper in CASSETTE Tray, machine Displays this message on LCD.
PAPER JAM 0	[Paper Jam 0] Open/Close Door	When the machine encountered paper jam in pick up area, Machine displays on the LCD until DOOR OPEN & CLOSE.
PAPER JAM 1	[Paper Jam 1] Open/Close Door	When the machine encountered paper jam in paper exit of Machine, machine displays on the LCD until DOOR OPEN & CLOSE.
PAPER JAM 2	[Paper Jam 2] Check Inside	When the machine encountered paper jam in paper exit of Machine, machine displays on the LCD until DOOR OPEN & CLOSE.
Communication Error	[COMM. Error]	When the machine has problem in communication, It displayed on the LCD. Machine displays this in case of Transmission. Machine displays this in case of fax handshaking step of Reception.
Line Error	[Line Error]	When the machine has problem in case of Fax Data reception step.
NO ANSWER	[No Answer]	When the machine could not connect to remote fax after Completion of redial up to redial counter in system data.
INCOMPATIBLE	[Incompatible]	Remote party did not have the requested feature, such as polling.
LINE BUSY	Line Busy	The remote fax didn't answer.
POWER FAILURE	Power Failure	When the machine's user memory has not been backup and There was power off / on.
STOP PRESSED	[Stop Pressed]	When the operator pressed the STOP button during transmission.
MEMORY FULL	Memory Full	When the machine has encountered the user memory was full.
FUSER ERROR	CRU Fuse Error	When the machine failed in installing the new toner cartridge.
LSU ERROR	[Hsync Error]	tech mode
LSU ERROR	[LSU Error]	user mode When the machine has encountered the Laser Beam Scanning unit could not reach the READY state.
TONER LOW	[Toner Low]	When the machine has encountered the Toner Low.
TONER EMPTY	[Toner Empty] [Replace Toner]	When the machine has encountered the Toner Empty.

<continue..>

STATUS	LCD Display	Descriptions
BY PASS JAM	[Bypass Jam]	When the machine detected the non feeding from BYPASS Tray.
GROUP is not available	Group Not Available	You have tried to select a group location where only a single Location number can be used.
RETRY REDIAL?	Retry Redial ?	the machine is waiting for the programmed interval to automatically redial a previously busy station.
NO. NOT ASSIGNED	NO. Not Assigned	The speed dial location you tried to use has no number assigned to it.
Load document	Load Document	You have attempted to set up a sending operation with no Document loaded.
Memory full and canel the job	Cancel ? 1:Yes 2:No	When the machine has encountered the memory full during storing the document into memory, the machine display the "CANCEL ?" to operator whether he/she make a decision the canceling the job or accept the scanned page so far to transmit the remained documents.
Job has not been created	Operation Not Assigned	When operator is doing in ADD/CANCEL operation and There is no job to handle if operator entered the job no.
Low Heat Error	[Low Heat Error]	Temperature could not reach certain level.
Open Fuser Error	Open Fuser Error	The thermister has been disconnected.
Over Heat Error	[Over Heat]	Temperature has gone up very high degree.
	[Jam 1] [No Catridge]	When the machine detected the toner cartridge has not been installed, or detected jam1 in warmup state.
Memory Dial Full	Memory Dial Full	During Auto dial transmission when all 15 jobs are configured and try to add 16th job

4.5 Engine Test Mode

The Engine Test Mode supplies useful functions to check the condition of the print engine. It tests the condition of each device and displays the result of the test on the LCD. It is divided into 5 functions (0~4), and these are shown below.

4.5.1 To enter the Engine Test Mode

To enter the Engine Test mode (SCX-4725FN)

Press Menu → # → 1 → 9 → 3 → 1 in sequence, and the LCD briefly displays **'Engine Test',** the machine has entered Engine Test Mode.
Press "0", "1", "2", "3" or "4" to select the Test No. (see list below – left hand column)

4.5.2 Diagnostic

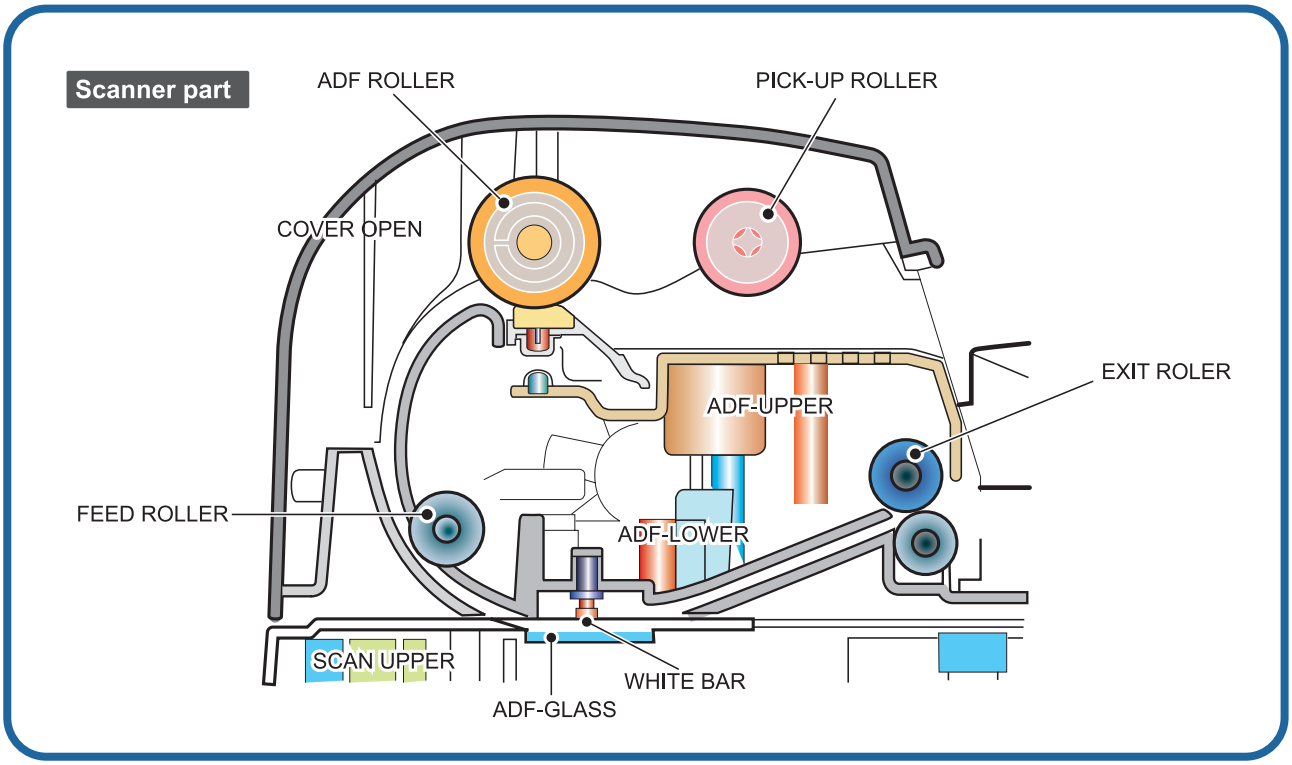
NO.	Sub No.	Engine test	Remark
0	1	Motor Test	1 : On, 2 : Off – next test selected
	2	Pick Up Test	1 : On, 2 : Off – next test selected
	3	Main Fan Test	1 : On, 2 : Off – next test selected
	4	SMPS FAN	1 : On, 2 : Off – next test selected
1	1	LSU Error Test	1 : On, 2 : Off – next test selected
	2	LD Test	1 : On, 2 : Off – next test selected
2	1	Feed Sensor Test	1. Check : read the sensor
			2. Next : Next Sensor test
	2	Exit Sensor Test	1. Check : read the sensor
			2. Next : Next Sensor test
	3	Cover Sensor Test	1. Check : read the sensor
			2. Next : Next Sensor test
	4	Empty Sensor Test	1. Check : read the sensor
			2. Next : Next Sensor test
3	1	Therm ADC 170	1 : On, 2 : Off (maintain the fusing temp.)
	2	Therm ADC 160	1 : On, 2 : Off (maintain the fusing temp.)
	3	Therm ADC 150	1 : On, 2 : Off (maintain the fusing temp.)
	4	Therm ADC 140	1 : On, 2 : Off (maintain the fusing temp.)
	5	Therm ADC 130	1 : On, 2 : Off (maintain the fusing temp.)
	6	Therm ADC 125	1 : On, 2 : Off (maintain the fusing temp.)
	7	Therm ADC 120	1 : On, 2 : Off (maintain the fusing temp.)
	8	Therm ADC 115	1 : On, 2 : Off (maintain the fusing temp.)
	9	Therm ADC 110	1 : On, 2 : Off (maintain the fusing temp.)
4	1	MHV Test (1300V)	1 : On, 2 : Off
	2	Dev Bias Test (350V)	1 : On, 2 : Off
	3	THV Test (1300V)	1 : On, 2 : Off
	4	THV Test (-)	1 : On, 2 : Off

4.5.3 Detail Description (Engine Test Mode)

Function Name	Description	Display
01.Motor Test	The main motor starts when the execution key is pressed and stops when the stop key is pressed.	Main Motor On/Off
02.Pick Up Test	Automatically stops, when the execution is chosen. stops, when the execution is chosen.	Tray 1,2 Solenoid On/Off
03.Fan Test	The fan starts when the execution key is pressed and stops when the stop key is pressed.	Fan On/Off
11.LSU Motor	The laser motor starts when the execution key is pressed and stops when the stop key is pressed.	Laser Motor On/Off
12.LSU Error Test	The LSU motor starts and "Laser Ready" is displayed if the motor spins at the correct speed, otherwise "Laser Error" is displayed.	Laser Leady On/Off
13.LD Test	"Diode On" is displayed, when the laser diode is on. Otherwise "Diode Off" is displayed.	Diode On/Off
21.Feed Sen Test	These functions allow the current state of the sensor to be displayed.	"Sensor Off" or " Sensor On "
22.Exit Sen Test		
23.Cover Sen Test	This function allows the current state of the Cover sensor to be displayed. Touch the sensor and confirm that the message changes: "Cover Open" to " Cover Close"	"Cover Open" or "Cover Close"
24.Empty Sen Test	These functions allow the current state of the sensor to be displayed.	"Sensor Off" or " Sensor On "
31.Them ADC 170	"Current value" is displayed on the upper line of the LCD, and "Target value" on the bottom line. Target value is limited from "191°C" to "80°C"	Target temperature and output temperature from thermistor and ADC.
32.Them ADC 160		
33.Them ADC 150		
35.Them ADC 140		
36.Them ADC 130		
37.Them ADC 125		
38.Them ADC 120		
39.Them ADC 115		
40.Them ADC 110		
41.MHV Test (1300V)	These Functions are provided to check whether the control of the HVPS is functioning correctly.	MHV On/Off
42.Bias Test (350V)		Dev Bias On/Off
43.THV Test (1300V)		THV EN/NEG On/Off
44.THV Test (-)		THV On/Off

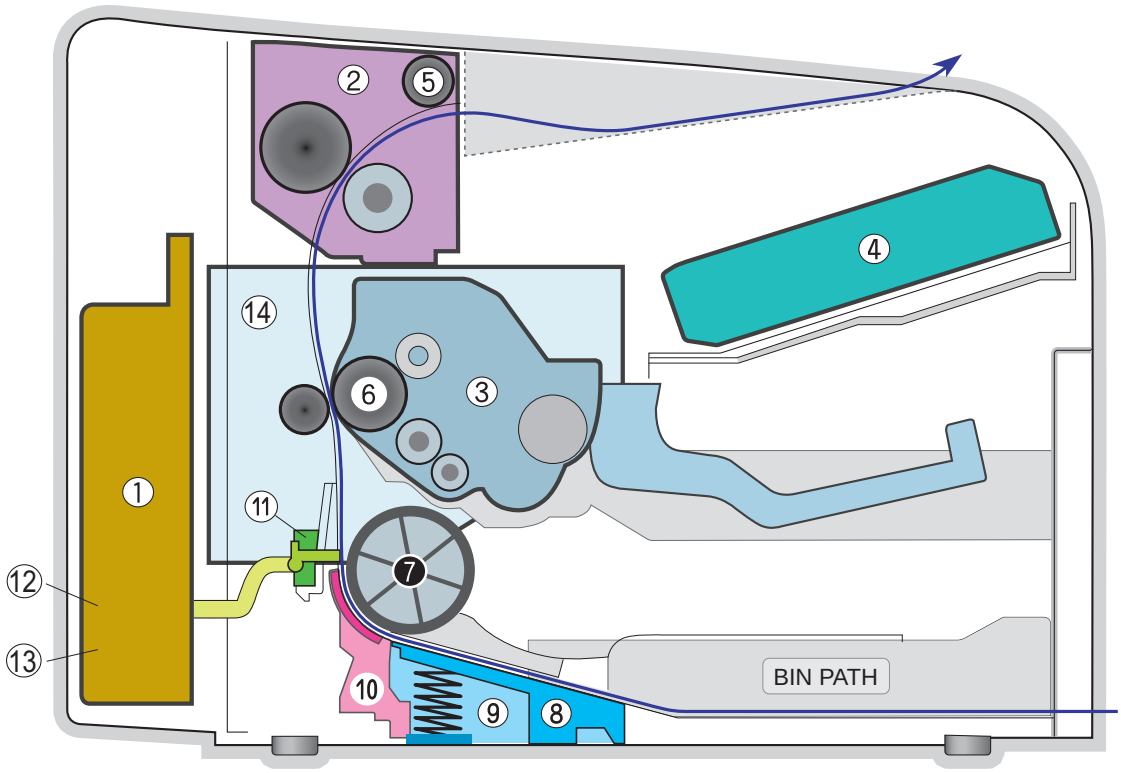
4.6 Paper Path and Clearing Paper Jams

4.6.1 Copy & Scan Document Path



4.6.2 Printer Paper Path

1) After receiving a print command, the printer feeds paper from the main cassette or manual feeder as required.
2) The paper being fed passes the paper feed sensor. (Jam 0 occurs if the sensor is not operated within a certain time)
3) Having passed the paper feed sensor the paper moves to the paper exit sensor via printing process. (Jam 1 occurs if the sensor is not operated within a certain time)
4) The paper then passes through the paper exit sensor and out of the set. (Jam 2 occurs if the trailing edge of the paper does not pass the exit sensor within a certain time of the paper leading edge activating the exit sensor)



❶ ENGINE SHIELD ASS'Y	❷ Fuser
❸ TONER CARTRIDGE	❹ LSU
❺ EXIT ROLLER	❻ OPC
❼ PICK-UP ROLLER	❽ KNOCK-UP PLATE
❾ KNOCK-UP PLATE DOWN	❿ ASS'Y HOLDER PAD
⓫ FEED SENSOR	⓬ MAIN PBA
⓭ SMPS	⓮ HVPS

4.6.3 Clearing Paper Jams

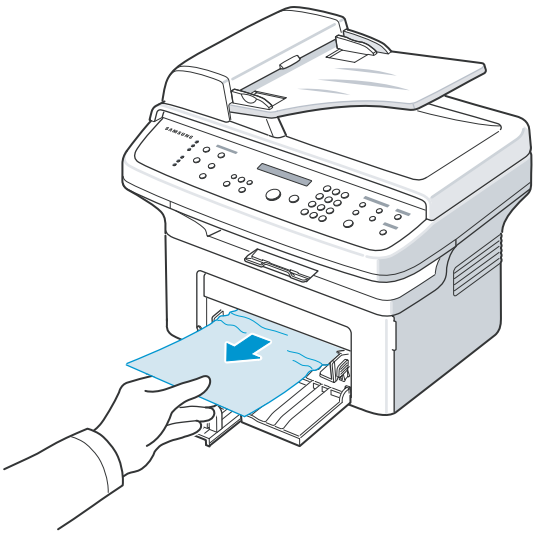
When a paper jam occurs, “Paper Jam” appears on the display.
Refer to the table below to locate and clear the paper jam.

Message	Location of Jam
[Paper Jam 0] Open/Close Door	In the tray
[Paper Jam 1] Open/Close	In the fuser area or around the toner Door cartridge.
[Paper Jam 2] Check Inside	In the paper exit area

To avoid tearing the paper, pull out the jammed paper gently and slowly. Follow the instructions in the following sections to clear the jam.

4.6.3.1 In the Tray

1. Remove the jammed paper in the tray by gently pulling it straight out.

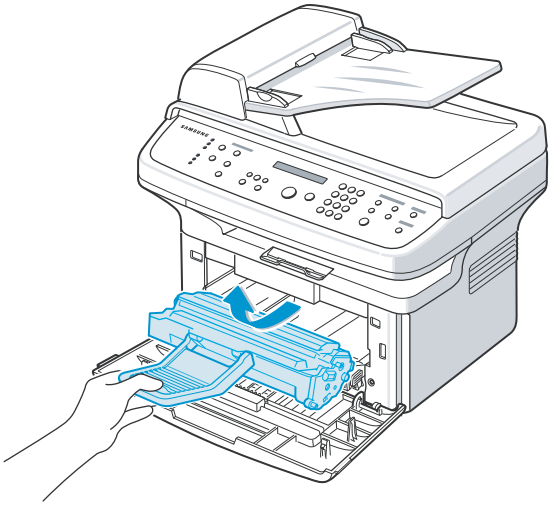


2. Open and close the front door to resume printing.

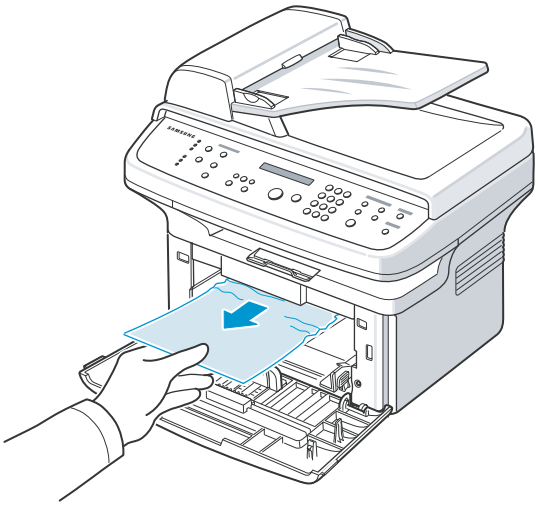
4.6.3.2 In the Fuser Area or Around the Toner Cartridge

NOTE: The fuser area is hot. Take care when removing paper from the machine.

1. Open the front door and pull the toner cartridge out, lightly pushing it down.



2. Remove the jammed paper by gently pulling it straight out.

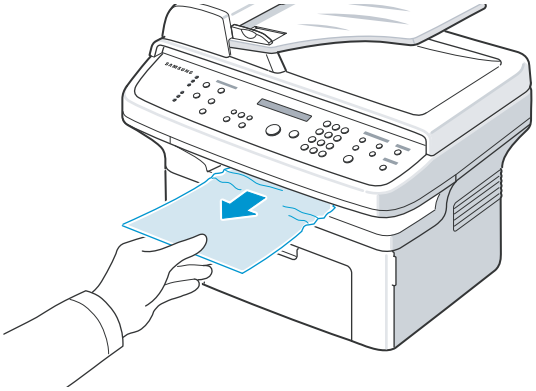


3. Replace the toner cartridge and close the front door. Printing automatically resumes.

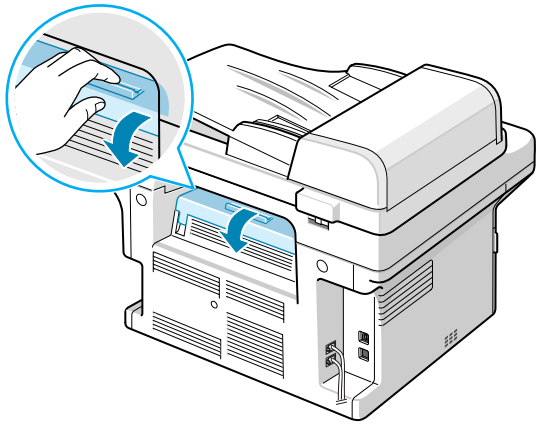
4.6.3.3 In the Paper Exit Area

1. Open and close the front door. The jammed paper automatically exits the machine.
   If the paper does not exit, continue to step 2.

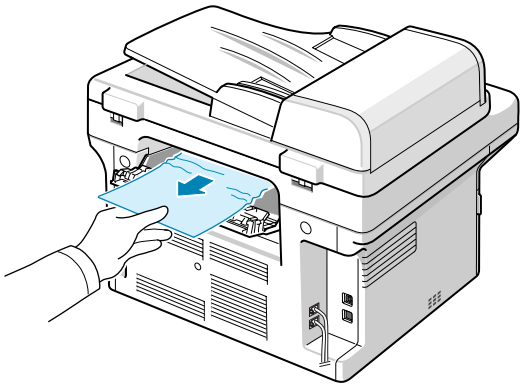
2. Gently pull the paper out of the output tray.



3. If there is any resistance and the paper does not move when you pull, or if you cannot see the paper in the output tray, open the rear door by pulling the tab on it.

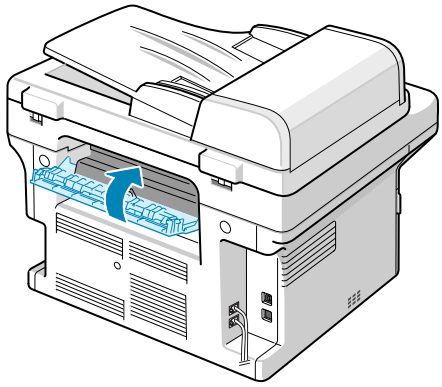


4. Remove the jammed paper by gently pulling it straight out.



NOTE: Inside of the machine is hot. Take care when removing paper from the machine.

5. Close the rear door.

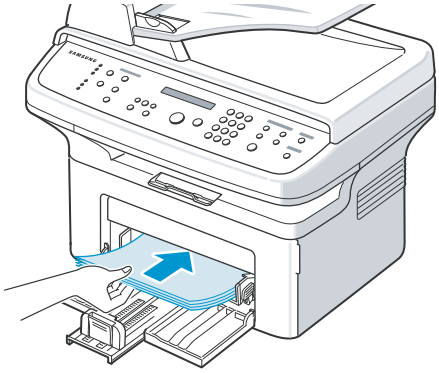


6. Open and close the front door to resume printing.

4.6.3.4 Tips for Avoiding Paper Jams When Printing on the A5-sized Paper

If paper jams occur frequently when you print on A5-sized paper:

1. Load the paper into the tray, as shown below.



2. Open the printer's properties window, set the paper size to A5 from the Paper tab.

3. From the Orientation option of the Layout tab, set the Rotate option to 90° .

4. Click OK to start printing.
   For details, see Software User's Guide.

4.6.3.5 Tips for Avoiding Paper Jams

By selecting the correct paper types, most paper jams can be avoided. When a paper jam occurs.

- Follow the procedures in "Loading Paper". Ensure that the adjustable guides are positioned correctly.
- Do not overload the tray.
- Do not remove paper from the tray while your machine is printing.
- Flex, fan, and straighten the paper before loading.
- Do not use creased, damp, or highly curled paper.
- Do not mix paper types in the tray.
- Use only recommended print materials. See "Paper Specifications".
- Ensure that the recommended print side of print materials is facing up in the tray.

5. Disassembly and Reassembly

5.1 General Precautions on Disassembly

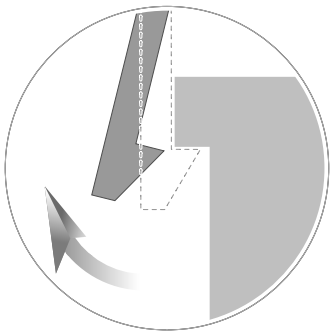
When you disassemble and reassemble components, you must use extreme caution. The close proximity of cables to moving parts makes proper routing a must.
If components are removed, any cables disturbed by the procedure must be restored as close as possible to their original positions. Before removing any component from the machine, note the cable routing that will be affected.

Whenever servicing the machine, you must perform as follows:

1. Check to verify that documents are not stored in memory.
2. Be sure to remove the toner cartridge before you disassemble parts.
3. Unplug the power cord.
4. Use a flat and clean surface.
5. Replace only with authorized components.
6. Do not force plastic-material components.
7. Make sure all components are in their proper position.

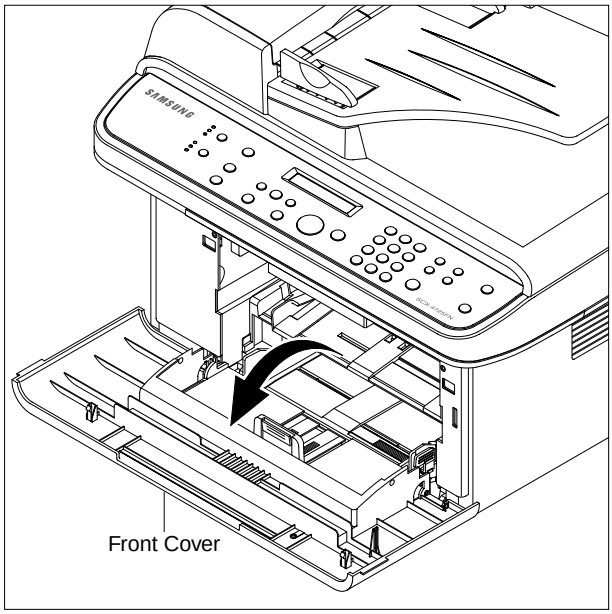
Releasing Plastic Latches

Many of the parts are held in place with plastic latches. The latches break easily; release them carefully.
To remove such parts, press the hook end of the latch away from the part to which it is latched.

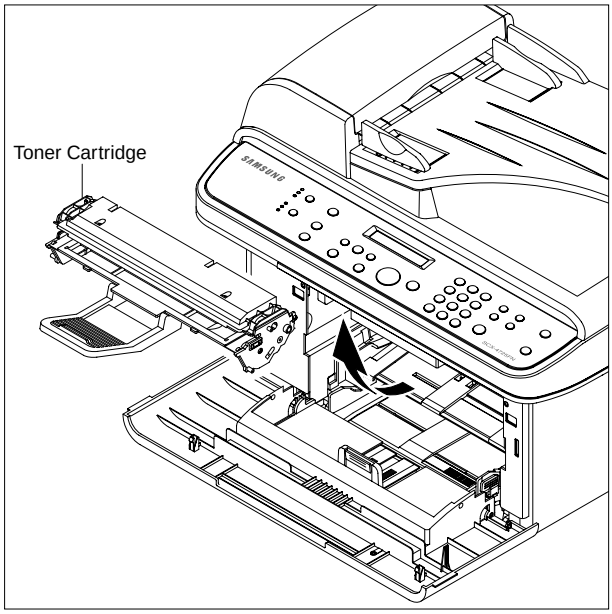


5.2 MP Tray

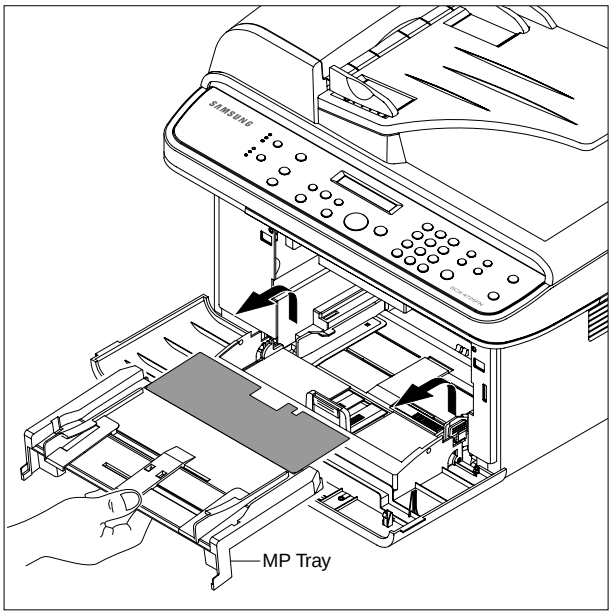
1. Open the Front Cover.



2. Release the Toner Cartridge.



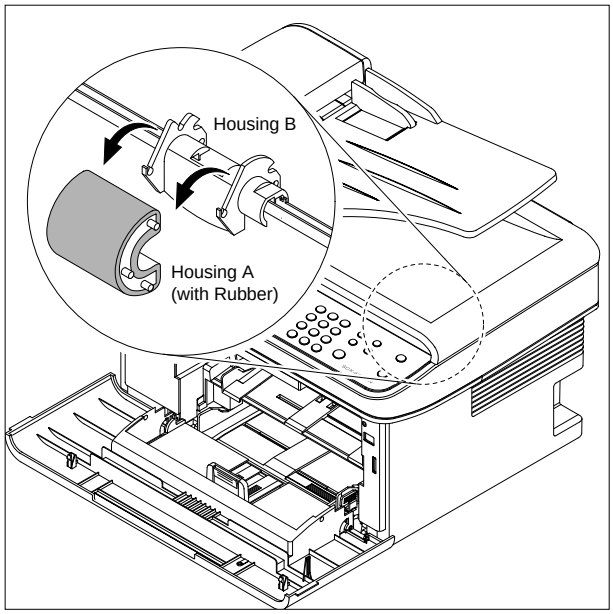
3. Hold the MP Tray and pull it to the arrow direction.



5.3 Pick Up Roller

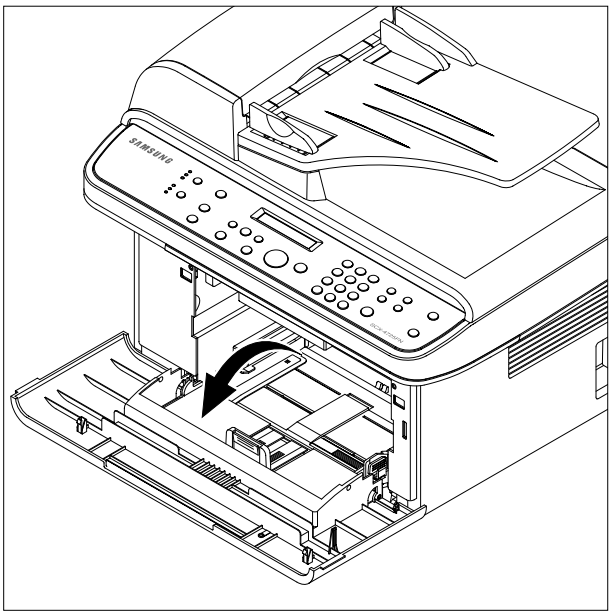
1. Before you remove the Pick Up Roller, you should remove:
   - MP Tray (Refer to the 5.2)

2. When if only remove the Pick Up Rubber, first pull the Pick Up Hausing A (with Rubber) from the Housing B in the direction of arrow and then release the Pick Up Rubber from the Housing A, as shown below.

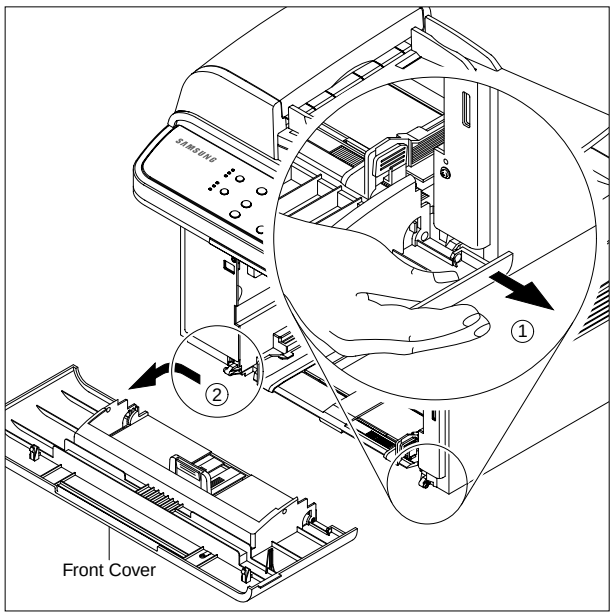


5.4 Front Cover

1. Open the Front Cover.

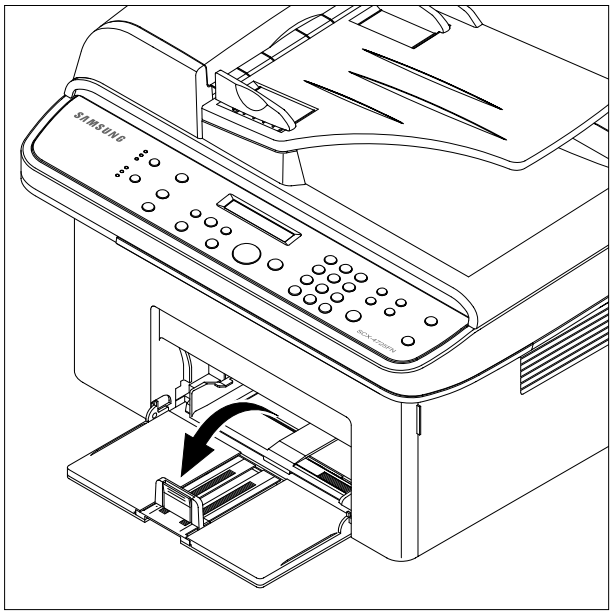


2. To remove the Front Cover, first pull the part below the right side of the Front Cover with a light pressure to the direction of arrow(left).

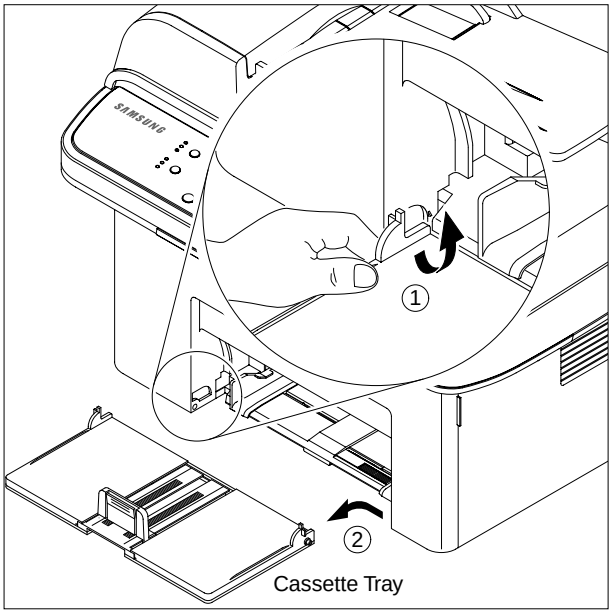


5.5 Cassette Tray

1. Open the Cassette Tray.

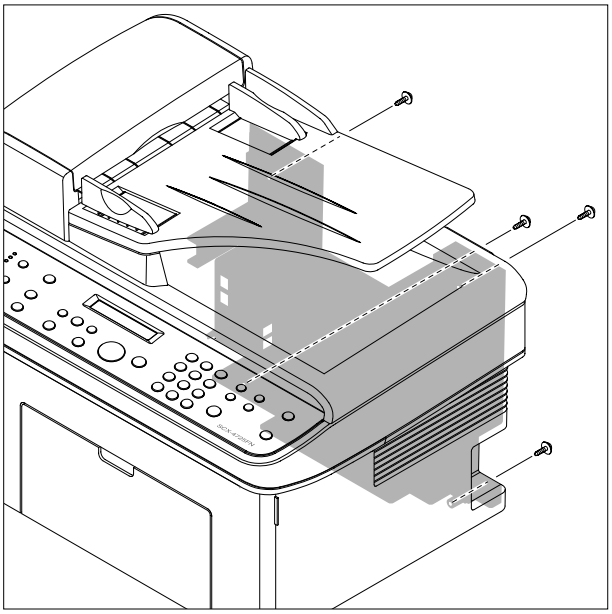


2. As shown below, to remove the Cassette Tray, lift the nob to the direction of the arrow with a light pressure while holding the Set(left).

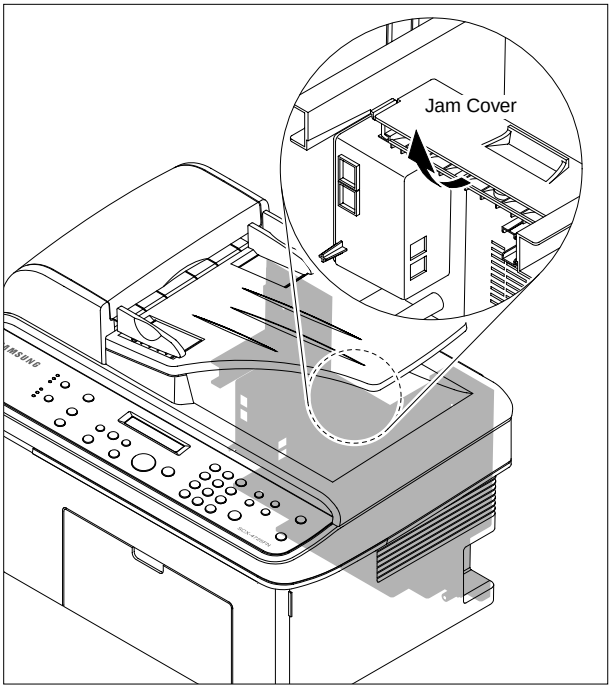


5.6 Rear Cover

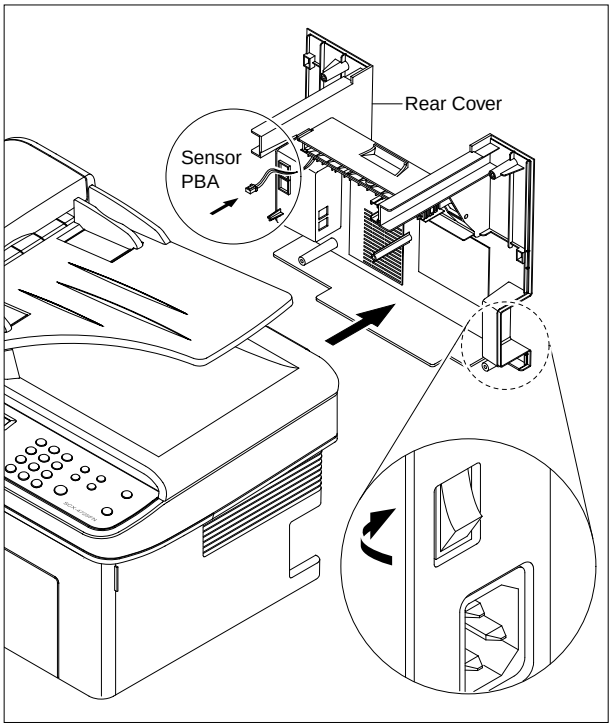
1. Remove the four screws securing the Rear Cover and remove it.



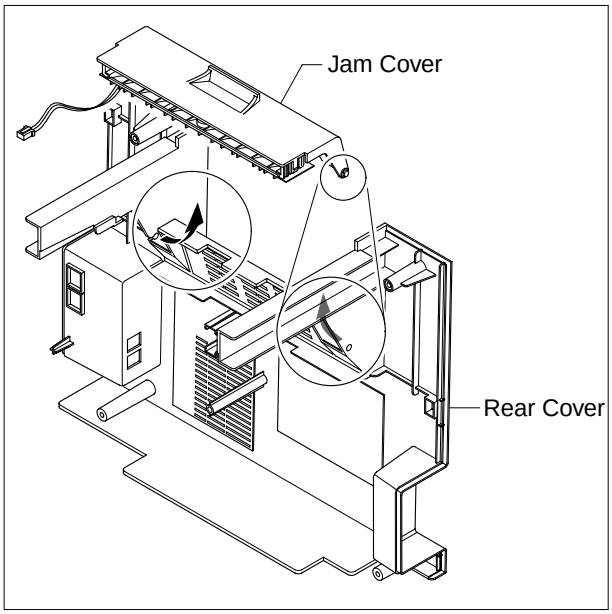
2. Open the Jam Cover.



3. To remove the Rear cover make sure the right Power Switch doesn't get jammed to the Rear Cover, as shown below.



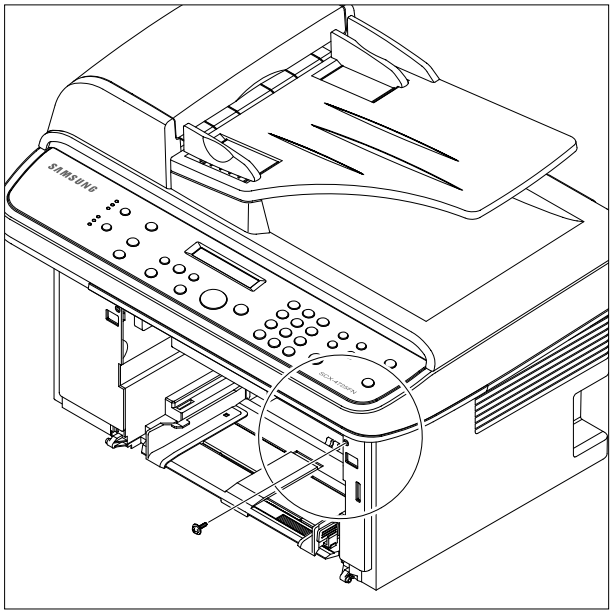
4. If necessary, remove the Jam Cover in the direction of arrow, as shown below.



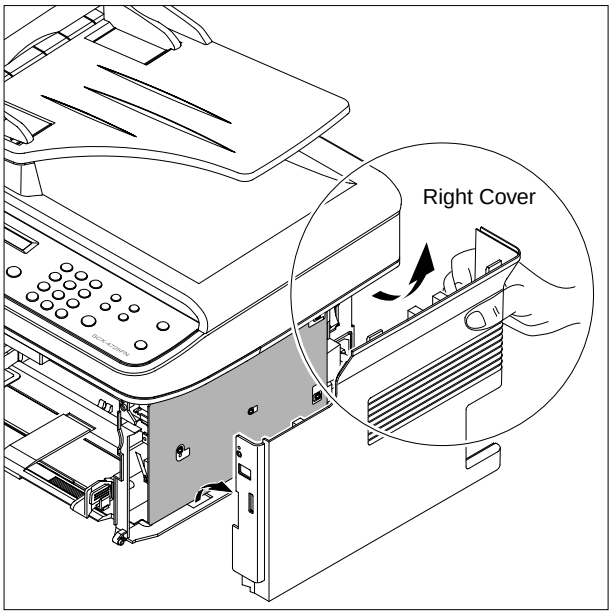
5.7 Right Cover

1. Before you remove the Right Cover, you should remove:
   - Front Cover (Refer to the 5.4)
   - Rear Cover (Refer to the 5.6)

2. Remove the one screws securing the Right Cover.



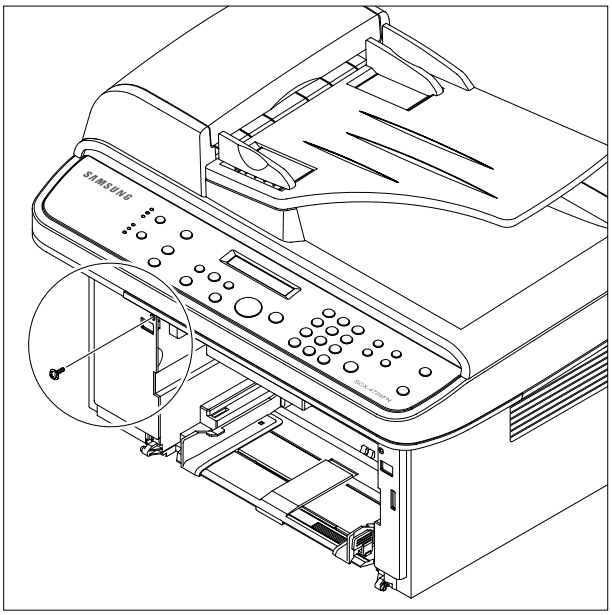
3. Apply light pressure to the back of the Right Cover and pull it to the right side in the direction of arrow, as shown below.



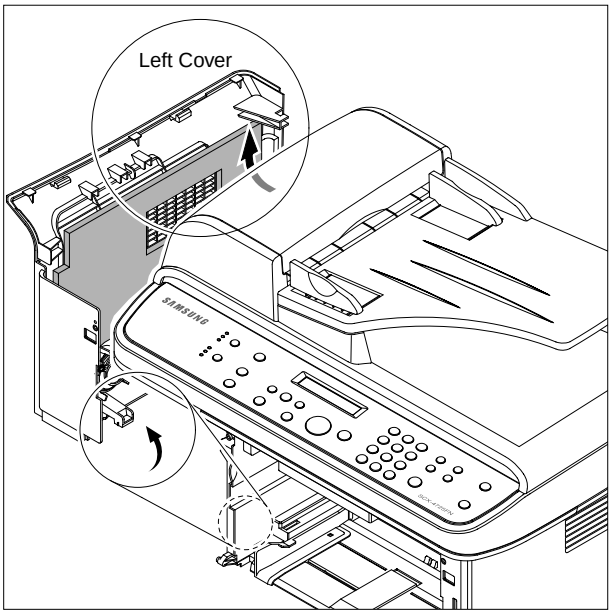
5.8 Left Cover

1. Before you remove the Left Cover, you should remove:
   - Front Cover (Refer to the 5.4)
   - Rear Cover (Refer to the 5.6)

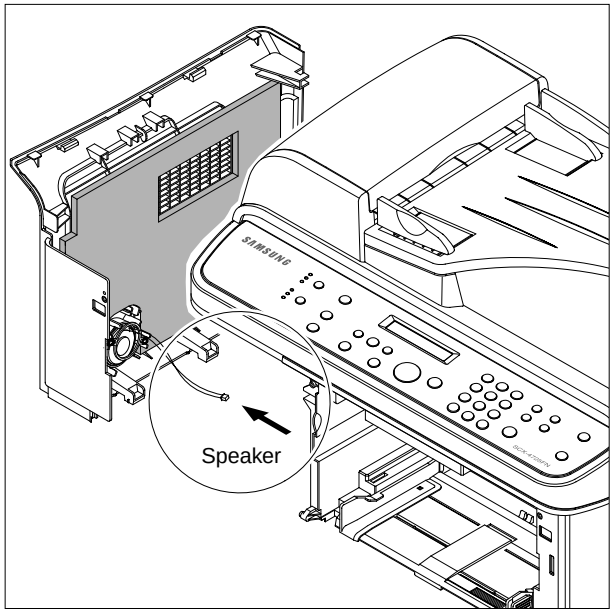
2. Remove the one screws securing the Left Cover.



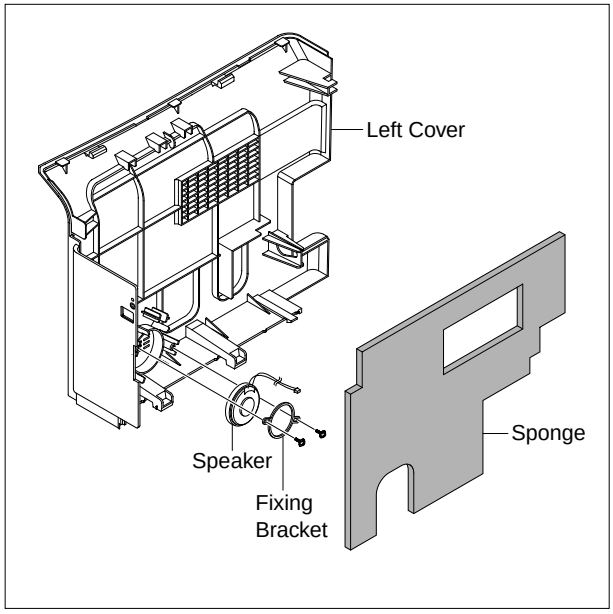
3. Apply light pressure to the back of the Left Cover and pull it to the leftt side in the direction of arrow, as shown below.



4. Unplug the Speaker Connector from the Main PBA.



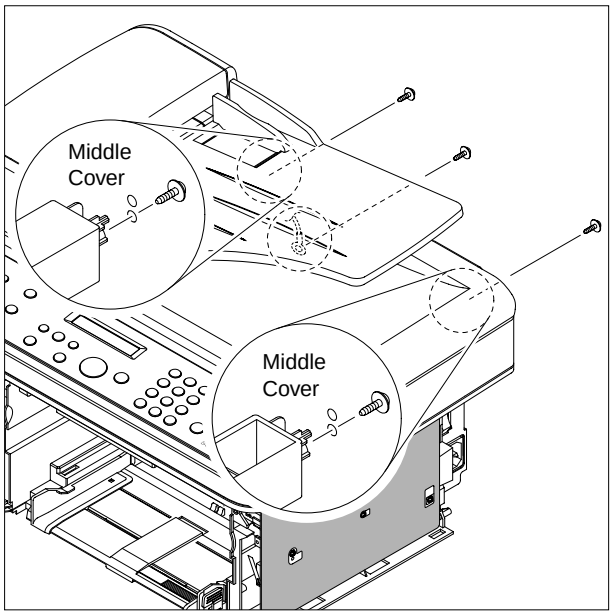
5. If necessary, remove the two screws securing the Speaker and remove it.



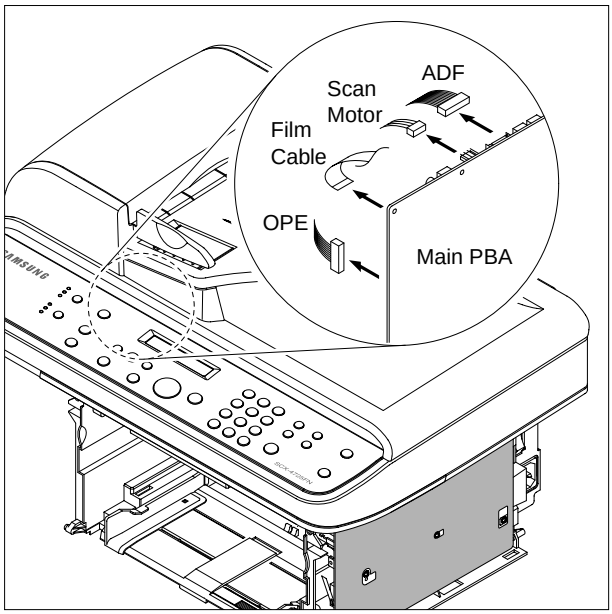
5.9 Scan Ass'y

1. Before you remove the Scan Ass'y, you should remove:
   - Rear Cover (Refer to the 5.6)
   - Right Cover (Refer to the 5.7)
   - Left Cover (Refer to the 5.8)

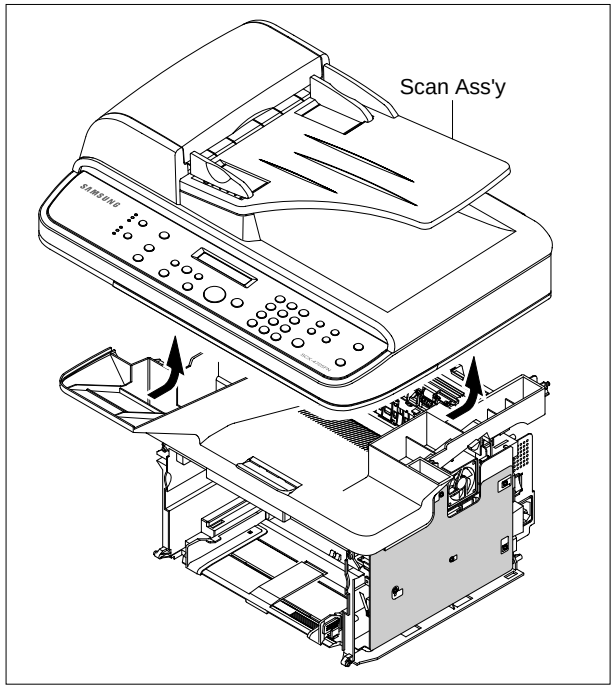
2. Remove the two screws from the Middle Cover and remove the screw securing the Ground Cable from the Main PBA, as shown below.



3. Unplug the three Connectors(ADF, Scan Motor, OPE) and Film Cable-CIS, as shown below.



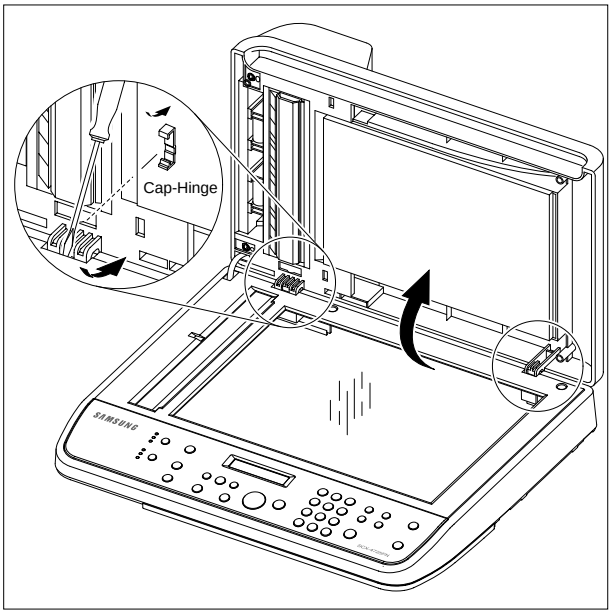
4. Release the Scan Ass'y in the direction of arrow, as shown below.



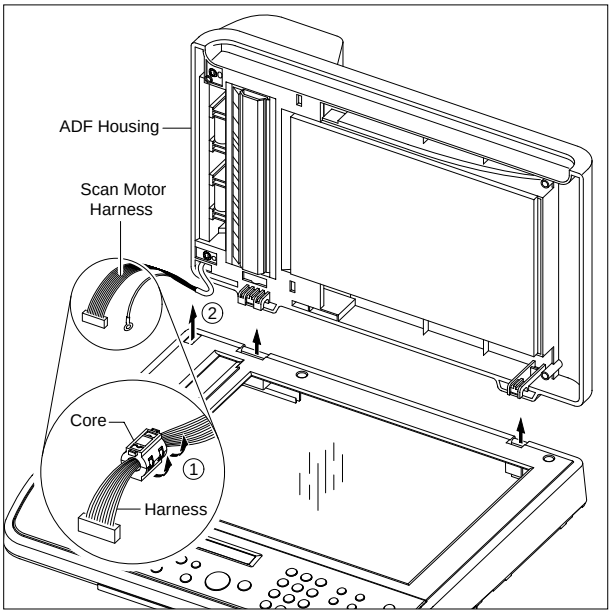
5.10 ADF Housing

1. Before you remove the ADF Housing, you should remove:
   - Scan Ass'y (Refer to the 5.9)

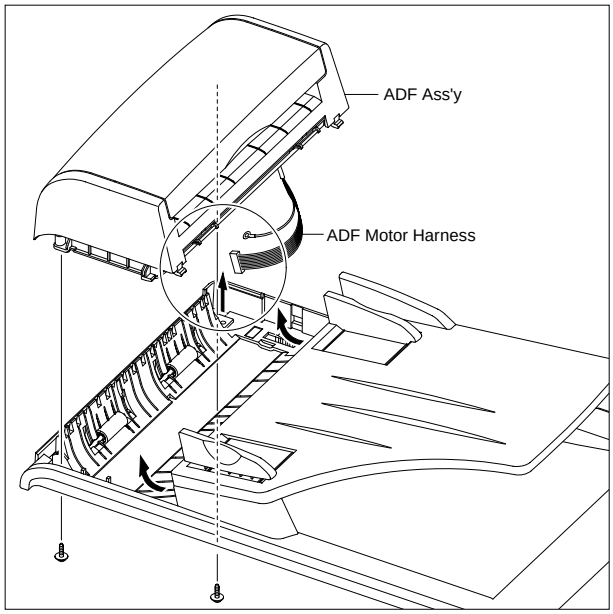
2. Open the ADF Housing and insurt a flat-blade screwdriver into the slot as shown below, and remove the Cap-Hinge from the Platen Housing and ADF Housing.



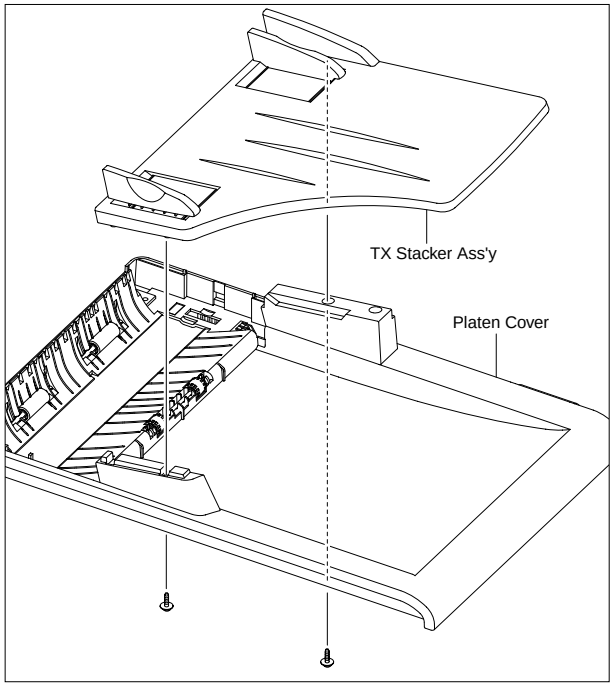
3. Remove the ADF Housing from the Platen Housing. At that time, carefully release the ADF Motor Harness from the Platen Housing, as shown below.



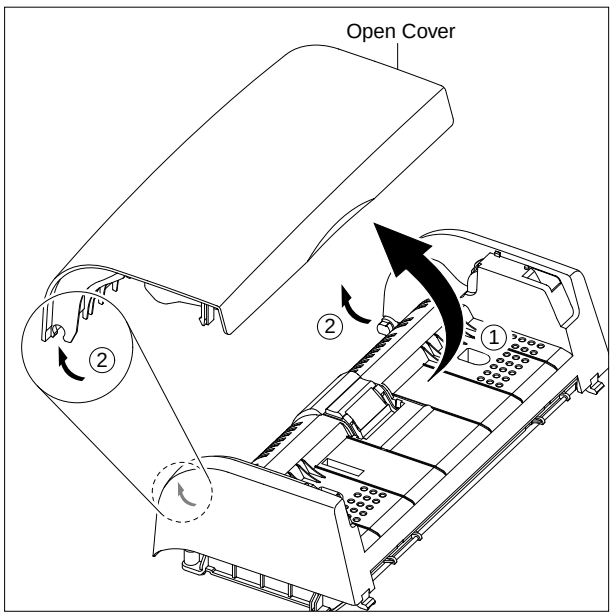
4. Remove the two screws securing the ADF Ass'y and remove it. At that time, carefully release the ADF Motor Harness from the Platen Cover, as shown below.



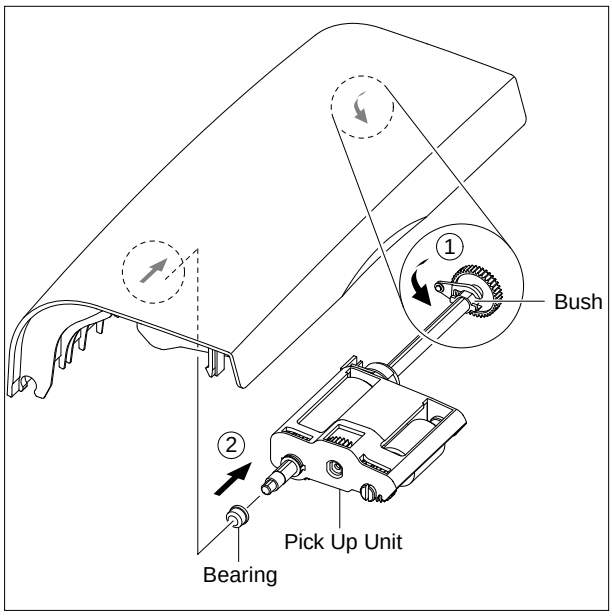
5. If necessary, remove the two screws securing the TX Stacker Ass'y and remove it, as shown below.



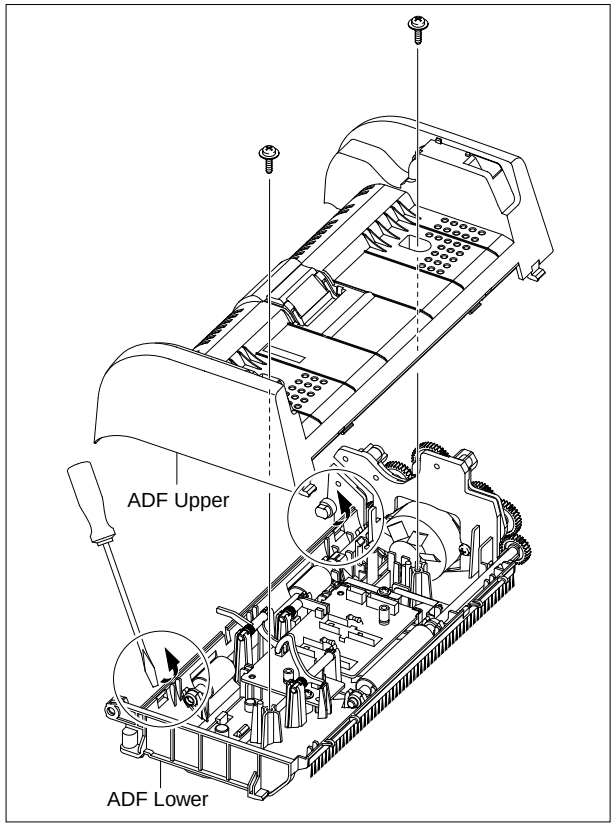
6. Open the Open Cover and remove the Open Cover in the direction of arrow, as shown below.



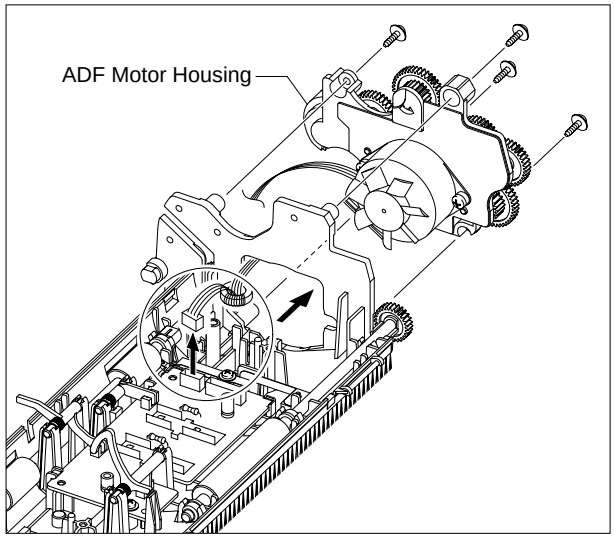
7. Pull the Bush, then rotate until it reaches the slot, as shown below. Then lift the Pick Up Unit.



8. Remove the two screws securing the ADF Upper and insurt a flat-blade screwdriver in to slot as shown below, and remove the ADF Upper.

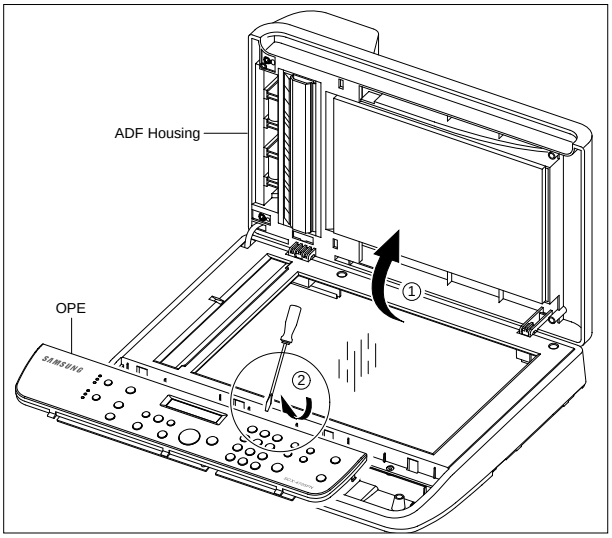


9. Unplug the Connector from the ADF PBA and remove the four screws securing the ADF Motor Housing and remove it in the direction of arrow, as shown below.

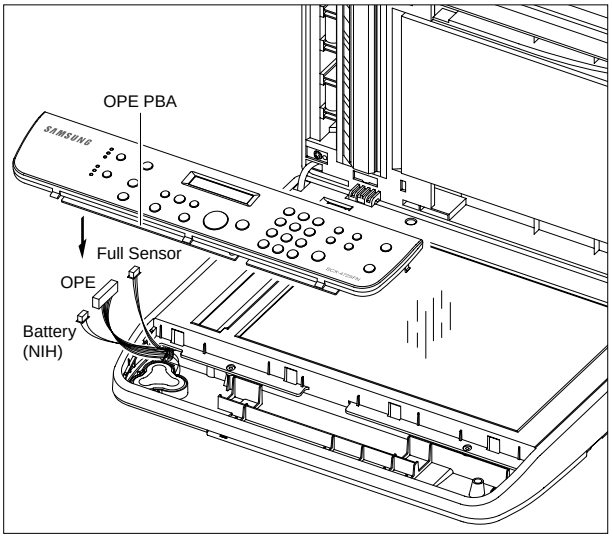


5.11 OPE Unit

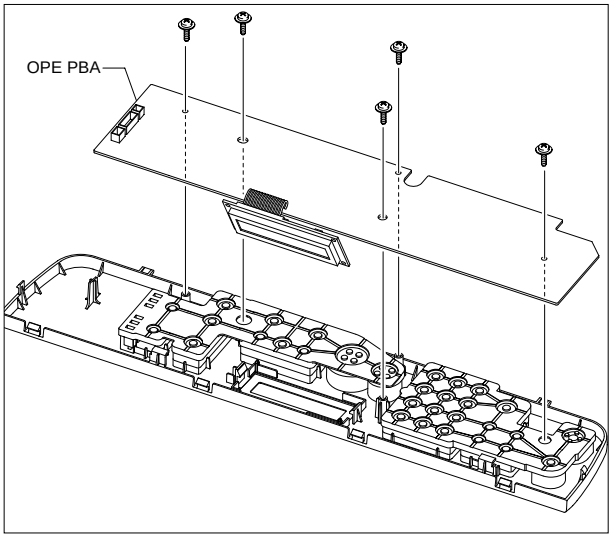
1. Open the ADF Housing and insurt a flat-blade screwdriver into the crack as shown below, and remove the OPE Unit from the Platen Housing.



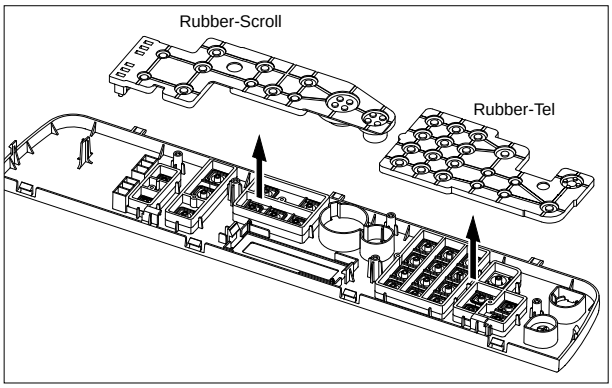
2. Unplug the three Connectors(Battery, OPE, Full Sensor), as shown below.



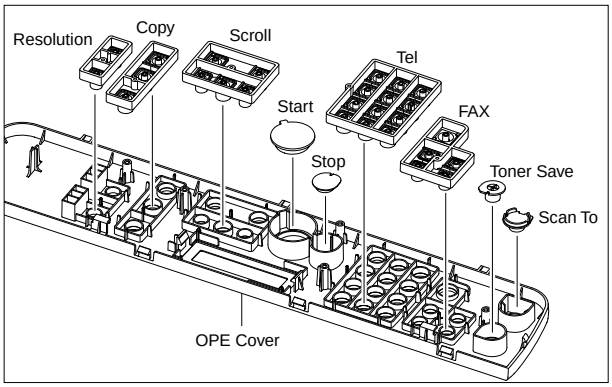
3. Remove the five screws securing the OPE PBA and remove it.



4. Release the Contact Rubbers, as shown below.



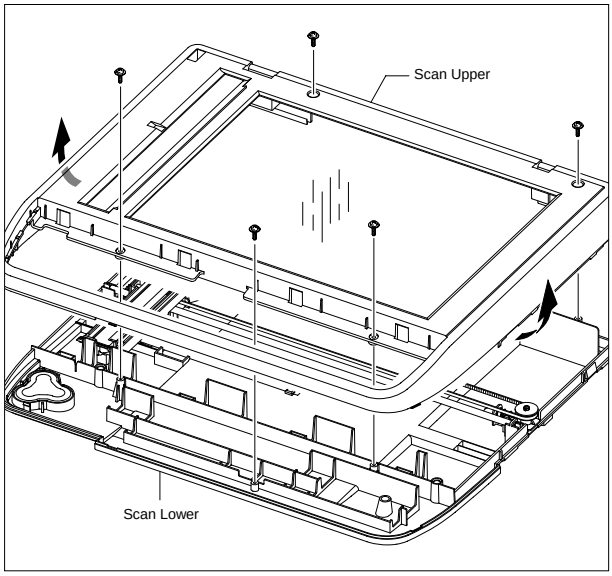
5. Release the Keys, as shown below.



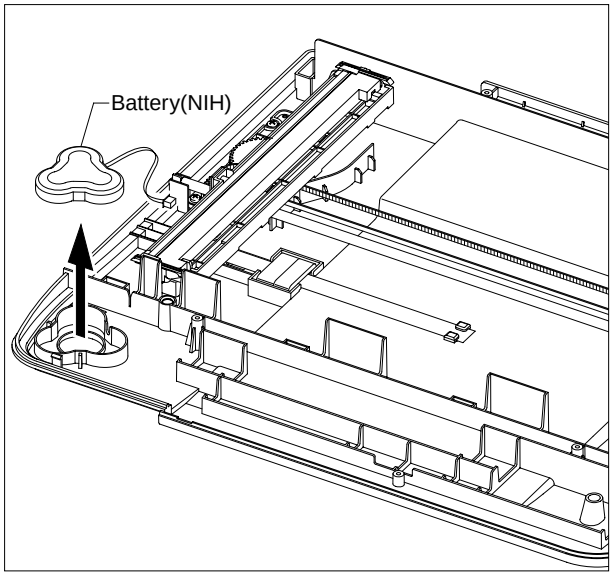
5.12 Platen Housing

1. Before you remove the Platen Housing, you should remove:
   - Scan Ass'y (Refer to the 5.9)
   - ADF Housing (Refer to the 5.10)
   - OPE Unit (Refer to the 5.11)

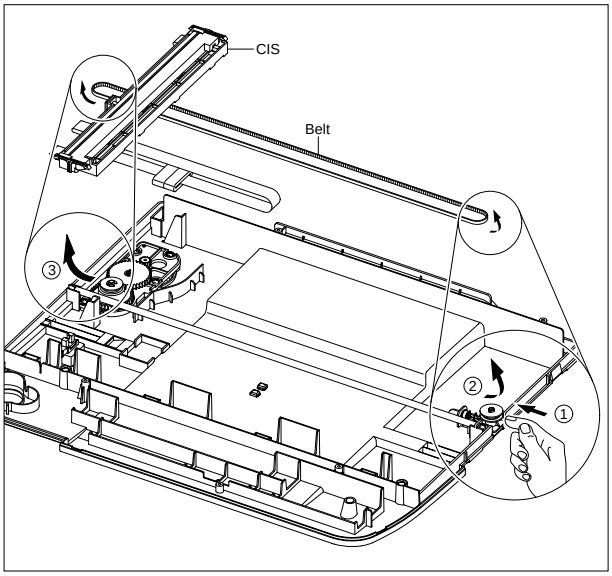
2. Remove the five screws from the Scan Upper and remove it from the Scan Lower, as shown below.



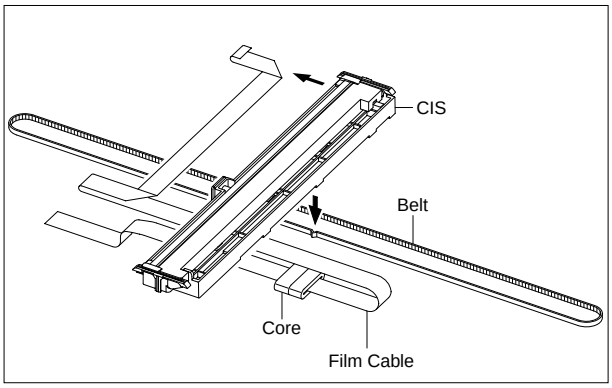
3. Take out the Battery(NIH).



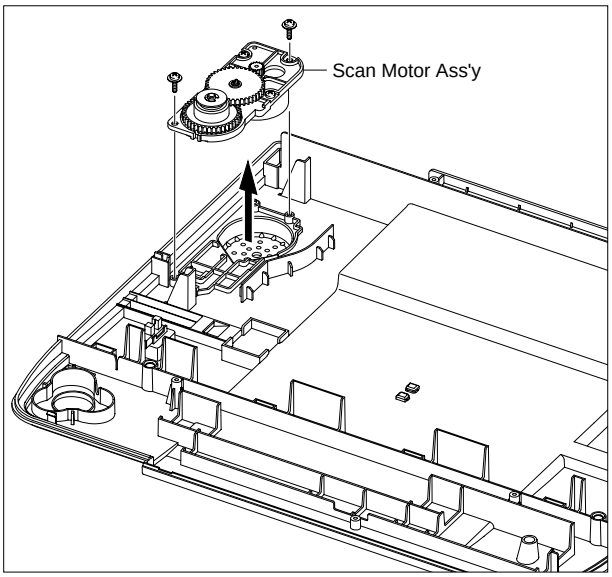
4. Push the Holder in the direction of arrow and remove the Belt, as shown below. (The CIS will come out at the same time.)



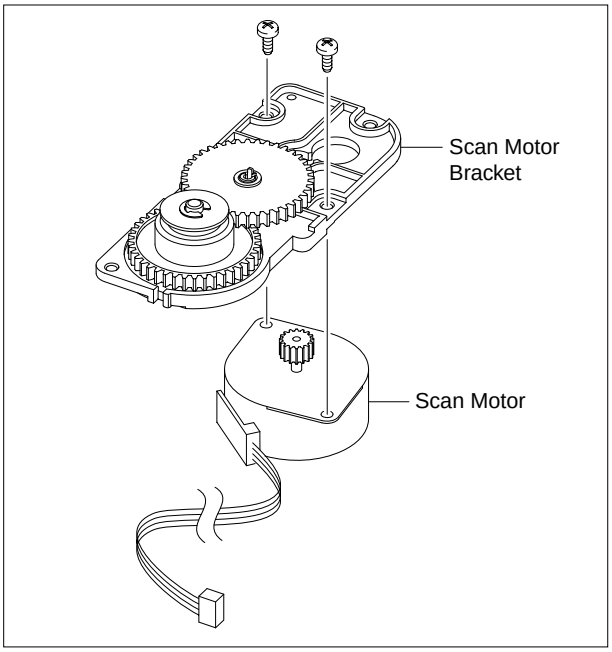
5. Release the Belt and Flat Cable from the CIS.



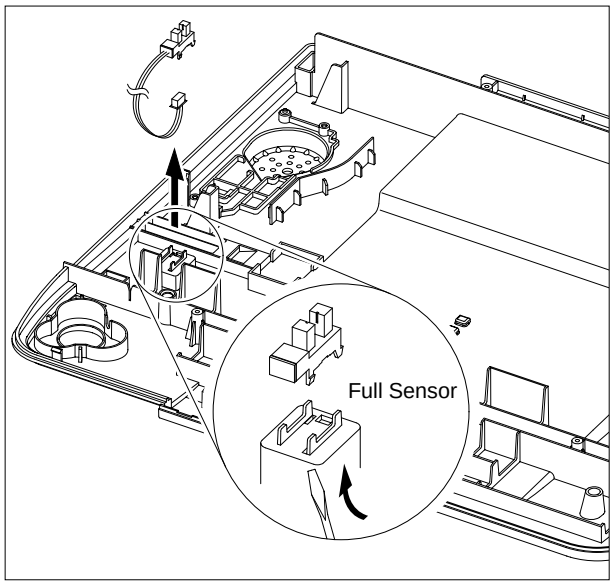
6. Remove the two screws securing the Scan Motor Ass'y and remove it.



7. If necessary, remove the two screws securing the Scan Motor and remove it.



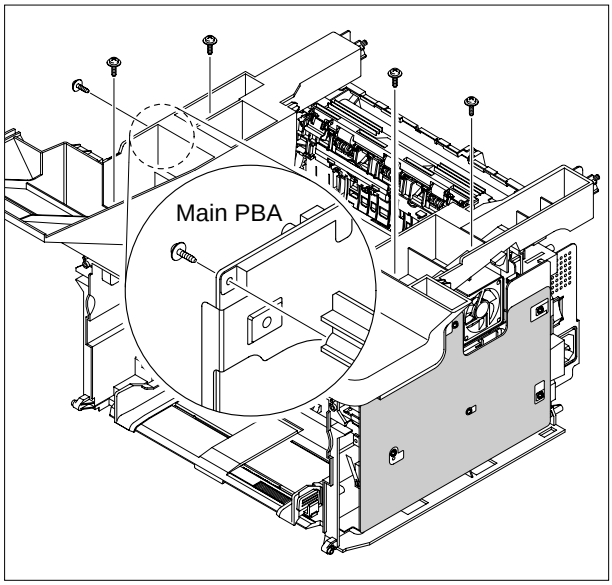
8. Using a flat-blade screwdriver remove the Full Sensor, as shown below.



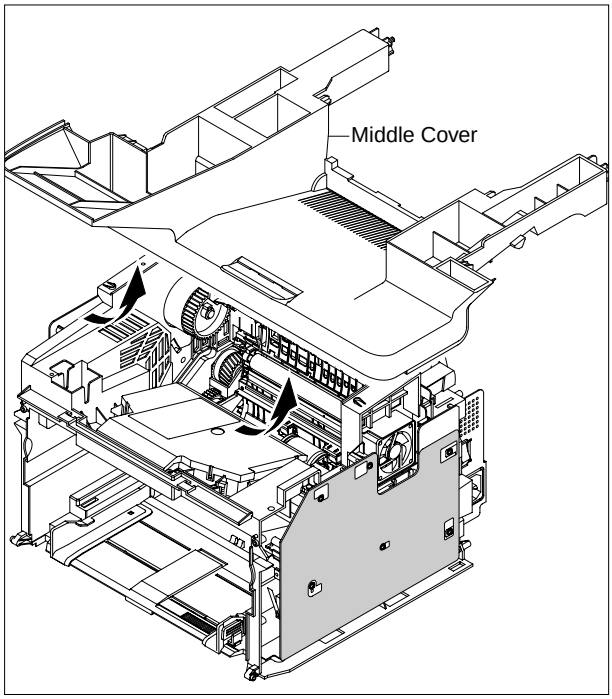
5.13 Middle Cover

1. Before you remove the Middle Cover, you should remove:
   - Scan Ass'y (Refer to the 5.9)

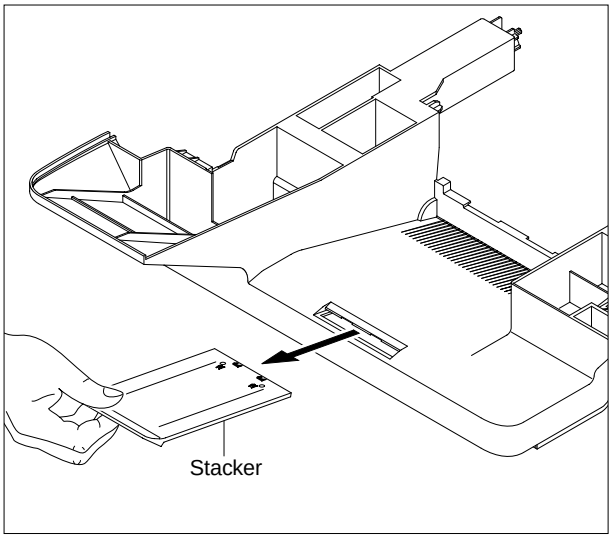
2. Remove the five screws securing the Middle Cover, as shown below.



3. Carefully release the Middle Cover in the direction of arrow, as shown below.



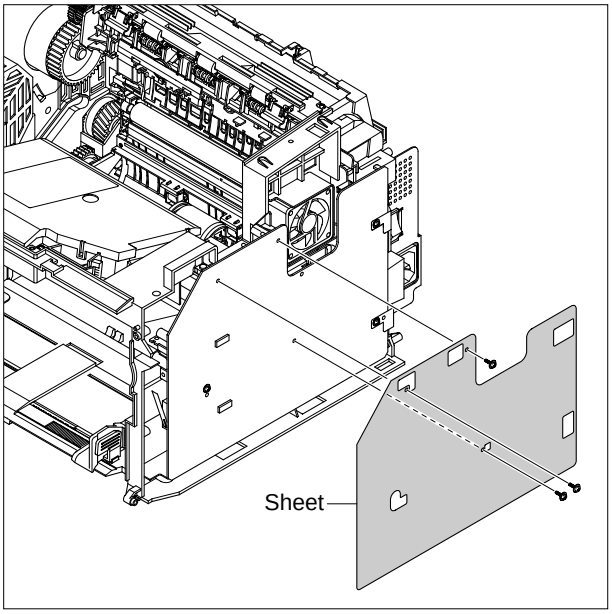
4. If necessary, take out the Stacker.



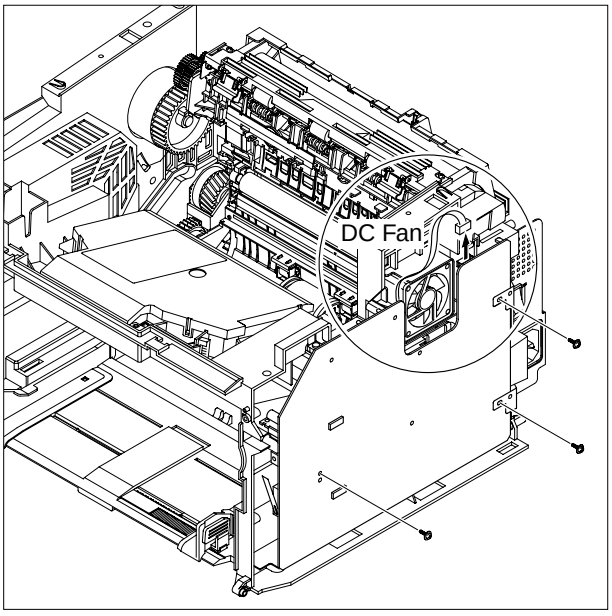
5.14 HVPS

1. Before you remove the HVPS, you should remove:
   - Scan Ass'y (Refer to the 5.9)
   - Middle Cover (Refer to the 5.13)

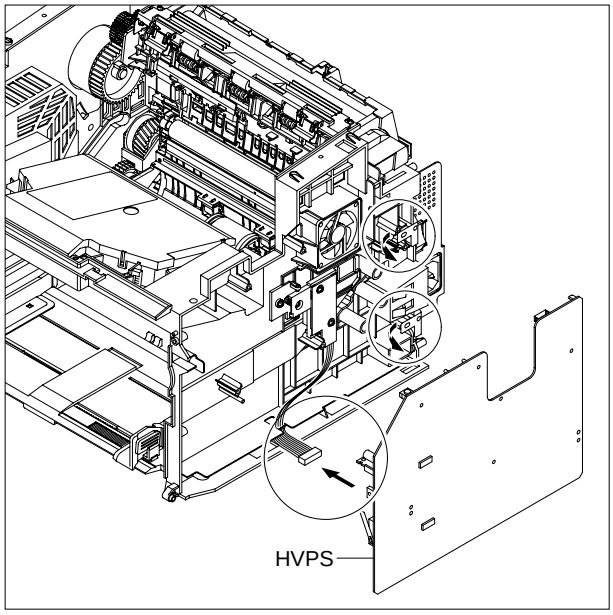
2. Remove the three screws securing the Sheet and remove it.



3. Remove the three screws securing the HVPS and unplug the connector(DC Fan) from the HVPS, as shown below.



4. Unplug the Connector from the HVPS and remove it.

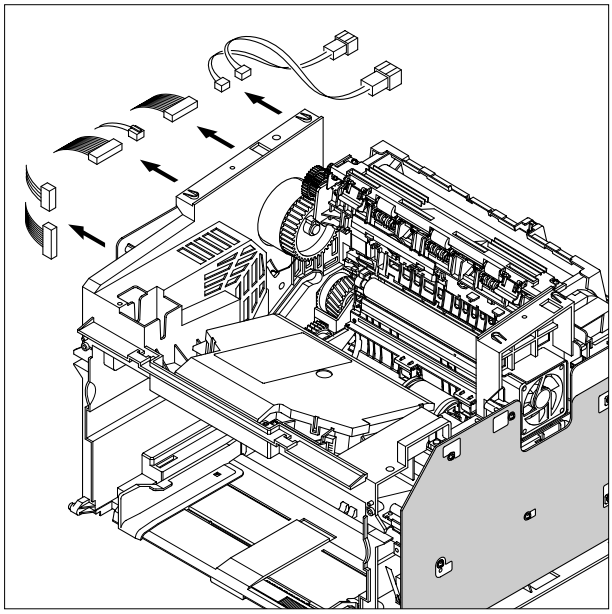


Notice : *Be awer of the Terminals(TR L) to ensure they are not lost.*

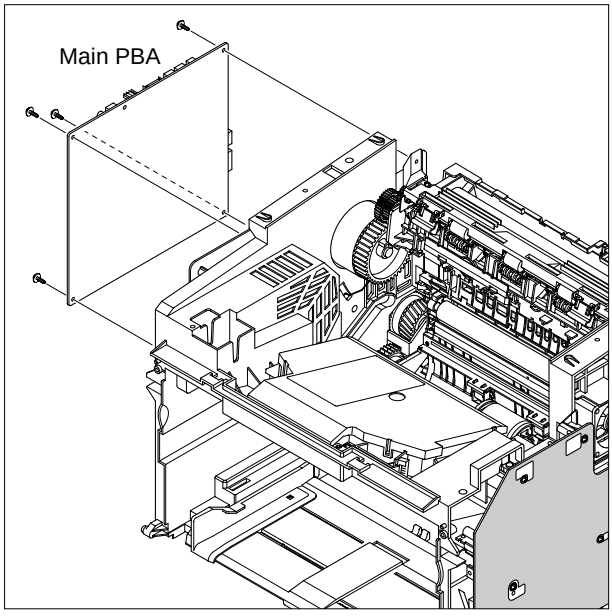
5.15 Main PBA

1. Before you remove the Main PBA, you should remove:
   - Scan Ass'y (Refer to the 5.9)
   - Middle Cover (Refer to the 5.13)

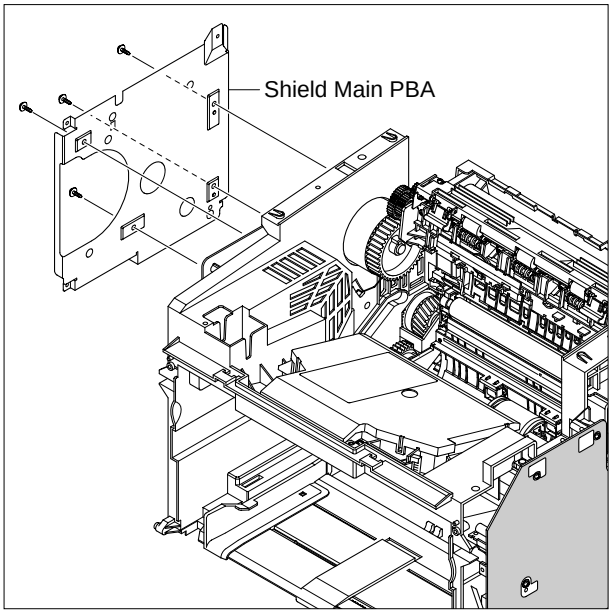
2. Unplug the all Connectors from the Main PBA, as shown below.



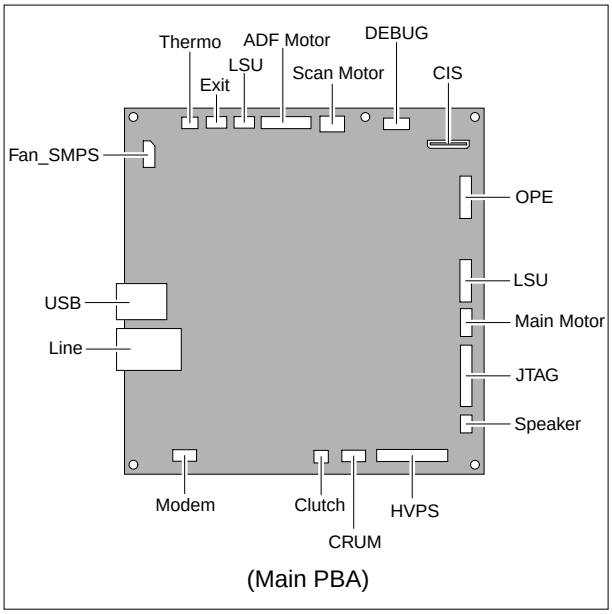
3. Remove the four screws securing the Main PBA and remove it.



4. Remove the four screws securing the Shield Main PBA and remove it.



5. The connectors are located, as shown below.

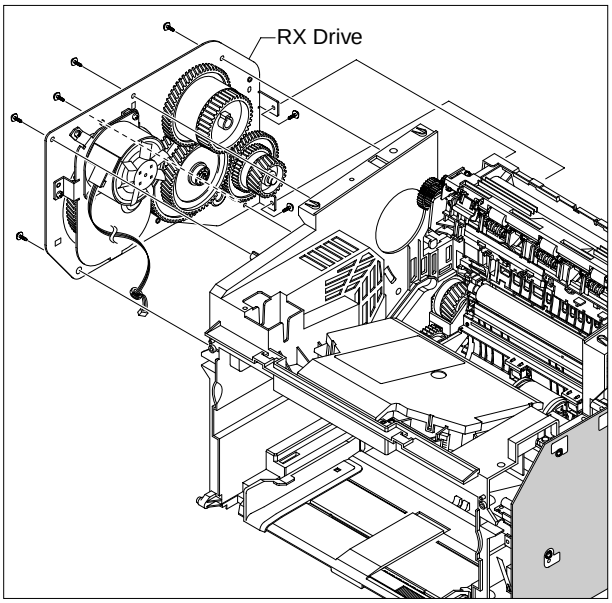


(Main PBA)

5.16 RX Drive

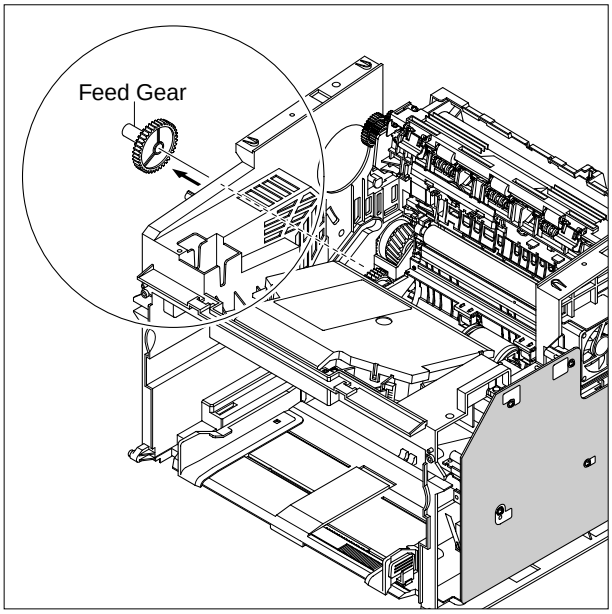
1. Before you remove the RX Drive, you should remove:
   - Scan Ass'y (Refer to the 5.9)
   - Middle Cover (Refer to the 5.13)
   - Main PBA (Refer to the 5.15)

2. Remove the two screws securing the Engine Shield and remove the five screws securing the Frame then remove the RX Drive in the direction of arrow, as shown below.

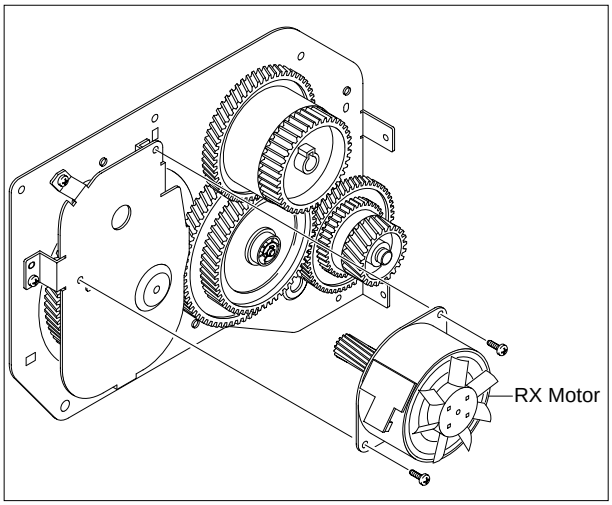


Notice : *The five screws have numbers stamped into the RX Drive Ass'y base plate.*
When refitting the Rx Drive Ass'y tighten the screws the order they are numbered.

3. For easy disassembly, release the Feed Gear from the Frame.



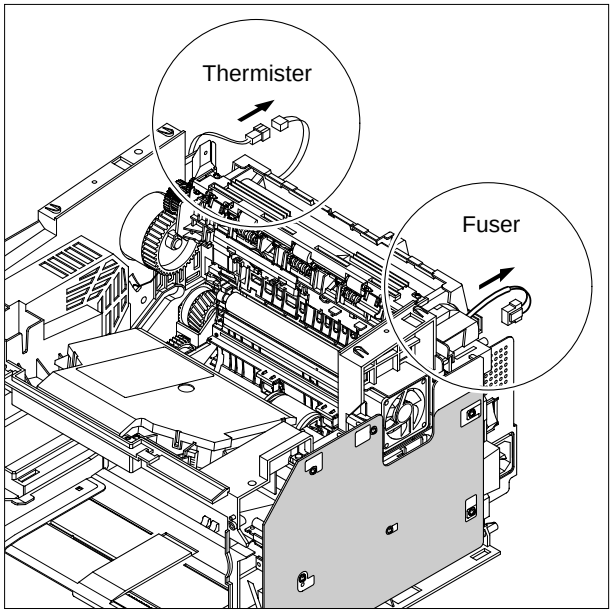
4. If necessary, remove the two screws securing the RX Motor and remove it.



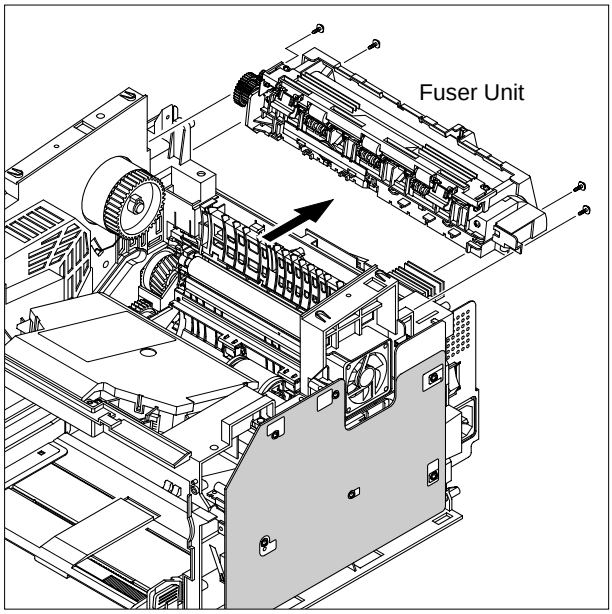
5.17 Fuser Unit

1. Before you remove the Fuser, you should remove:
   - Scan Ass'y (Refer to the 5.9)
   - Middle Cover (Refer to the 5.13)

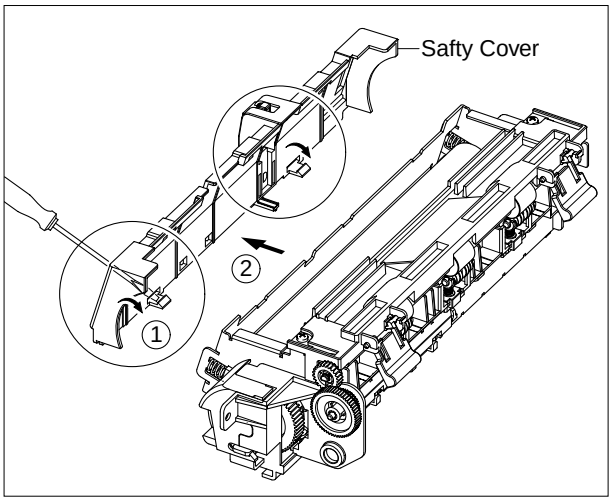
2. Unplug the two Connectors from the SMPS and Main PBA, as shown below.



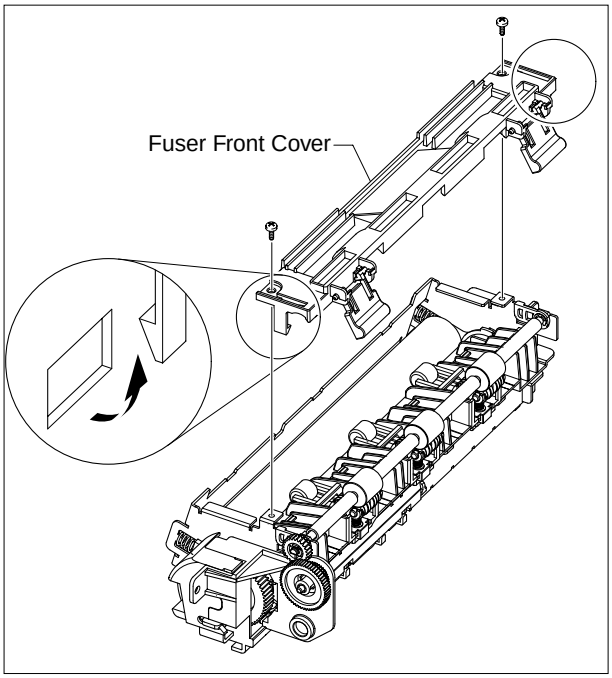
3. Remove the four screws securing the Fuser and remove it, as shown below.



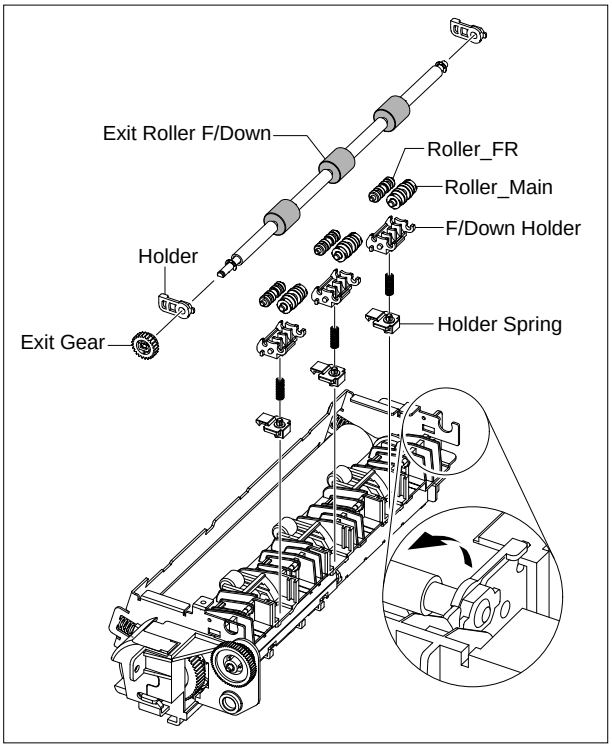
4. Remove the Safty Cover using a flat-blade screw-driver, as shown below.



5. Remove the two screws securing the Fuser Front Cover and remove it, as shown below.

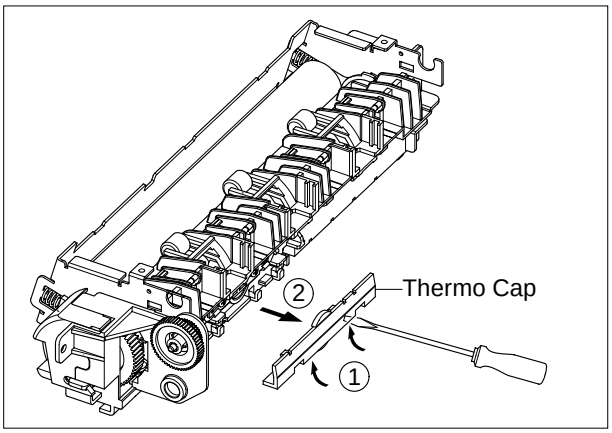


6. As shown below rotate the Holder to the direction of the arrow which is attached to the Exit Roller F/Down and Exit Gear(DR38/25).
(The Roller_Main, Roller_FR, F/Down Holder, Spring will come out at the same time.)

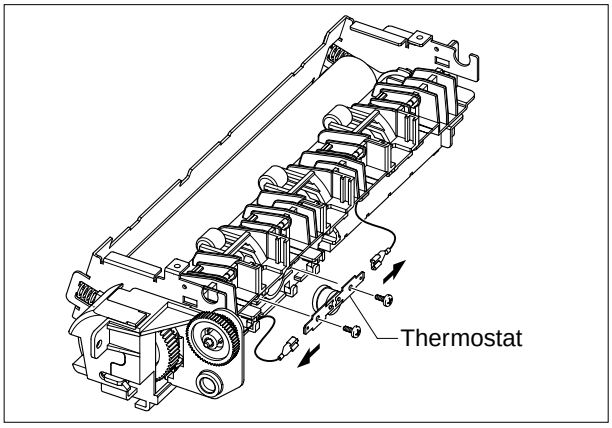


Notice : *If you don't follow the direction above the Spring will come out forcing the Roller_Main, Roller_FR, F/Down Holder inside the Frame Ass'y.*

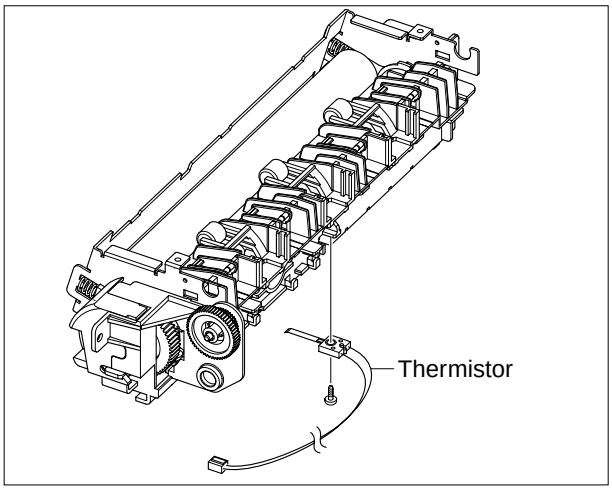
7. To remove the Thermo Cap, first unlatch the hooks using a flat-blade screwdriver in the direction of arrow and then pull the Thermo Cap, as shown below.



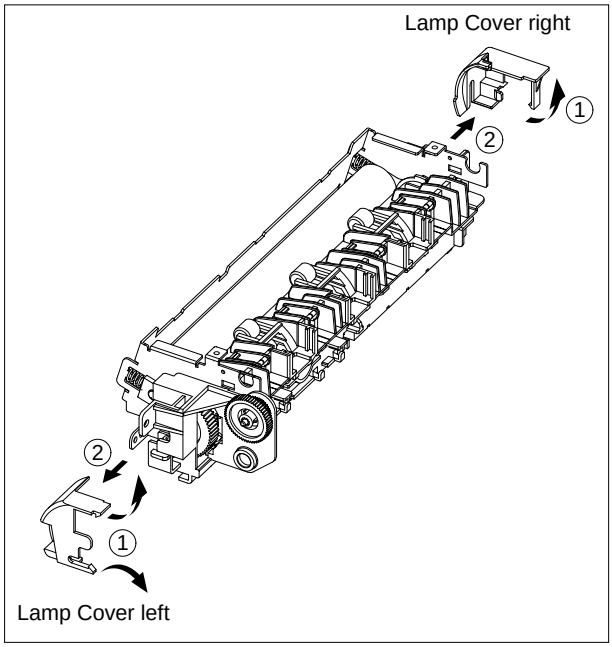
8. First remove the two screws securing the Thermostat and then take out the Thermostat and release the CBF Harness, as shown below.



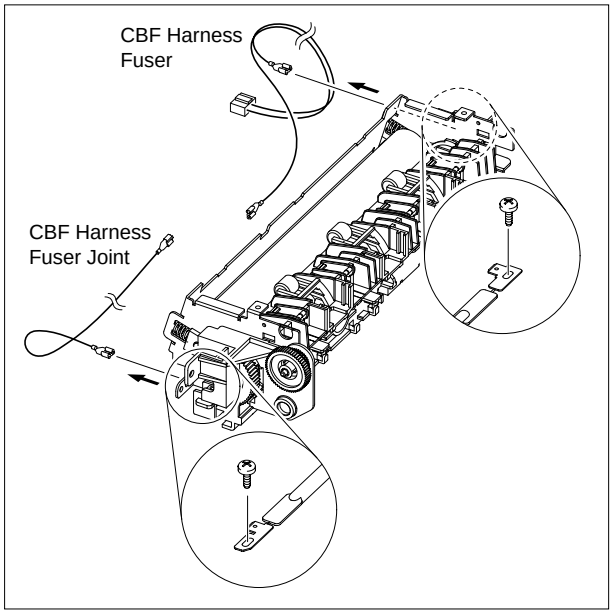
9. Remove the screw securing the Thermistor Harness and take out the Thermistor, as shown below.



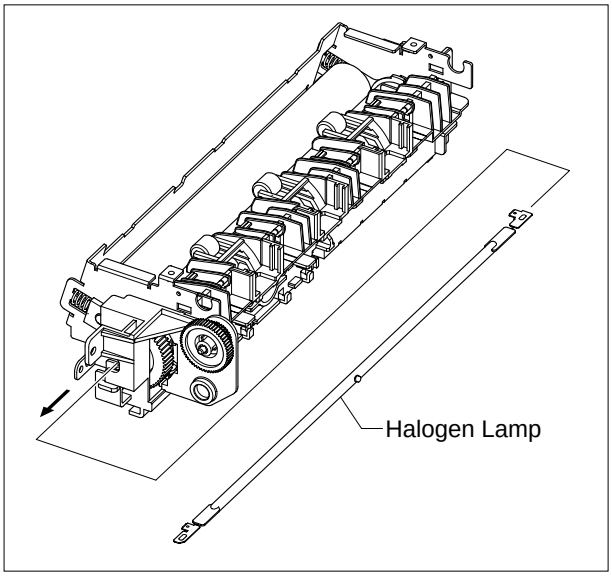
10. First unlatch the hooks and remove the Lamp Cover right and left, as shown below.



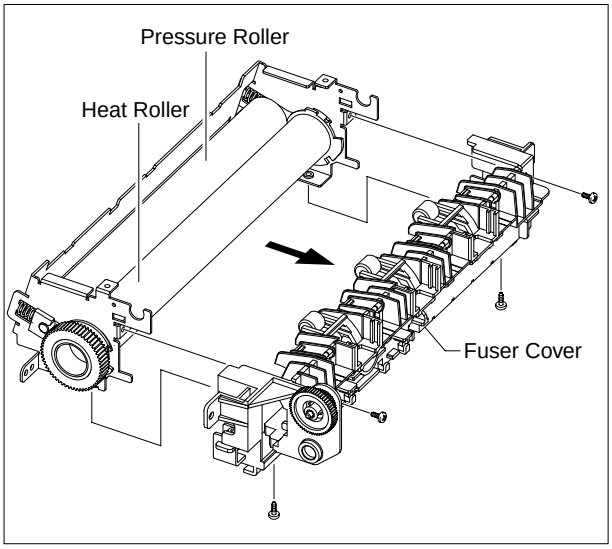
11. Release the CBF Harness from the Halogen Lamp and remove the two screws securing the Halogen Lamp, as shown below.



12. Carefully release the Halogen Lamp in the direction of arrow.



13. If necessary, remove the four screws securing the Fuser Cover and remove it.

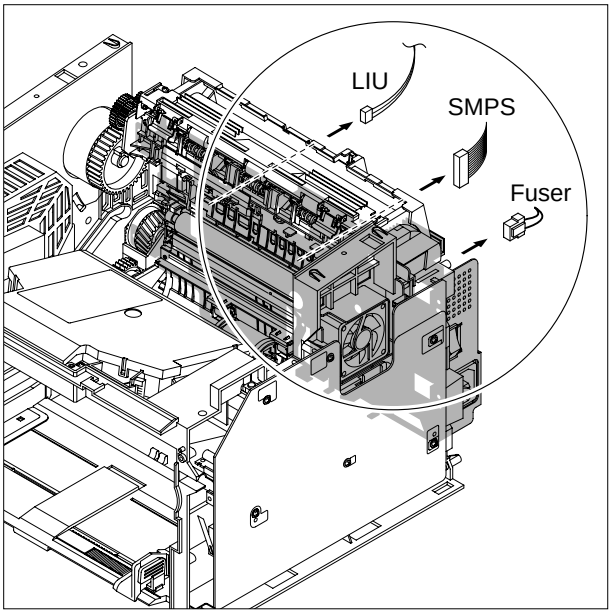


Notice : *Be careful not to damage or contaminate the surface of the roller when assembling and disassembling the Heat Roller.*

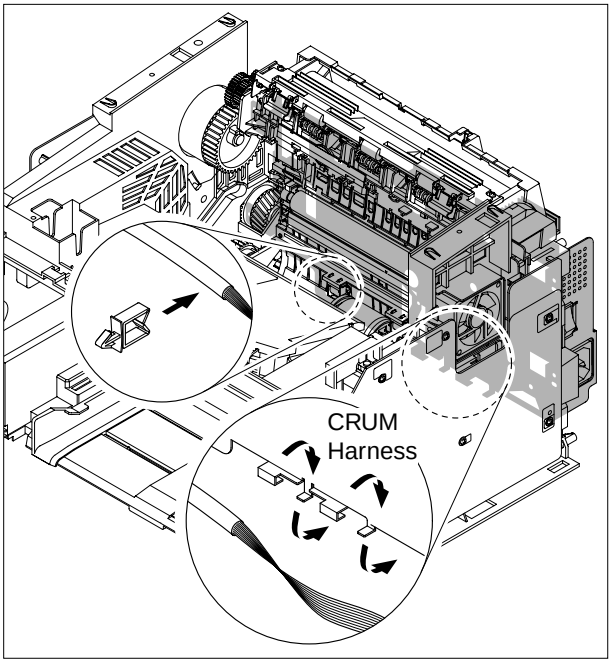
5.18 Engine Shield (With LIU PBA, SMPS)

1. Before you remove the Engine Shield, you should remove:
   - Scan Ass'y (Refer to the 5.9)
   - Middle Cover (Refer to the 5.13)

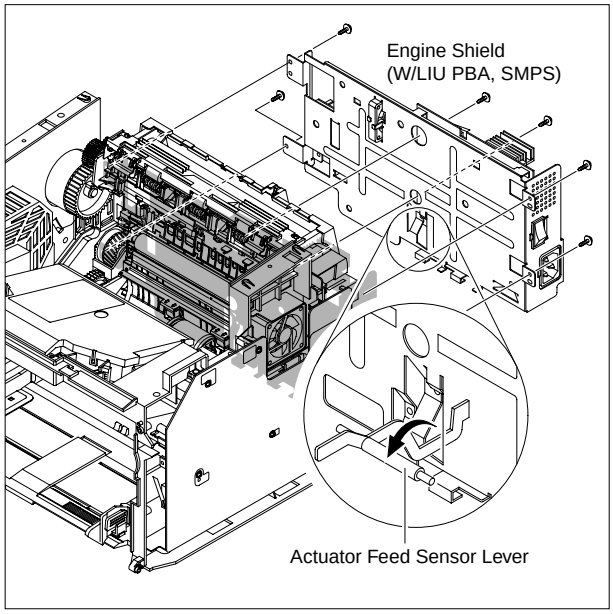
2. Unplug the all Connectors from the SMPS and LIU PBA.



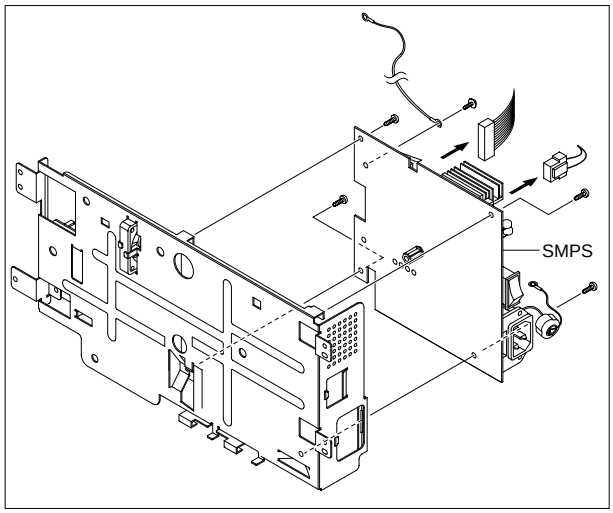
3. Carefully release the CRUM Harness below the bottom of the Engine Shield in the direction of arrow.



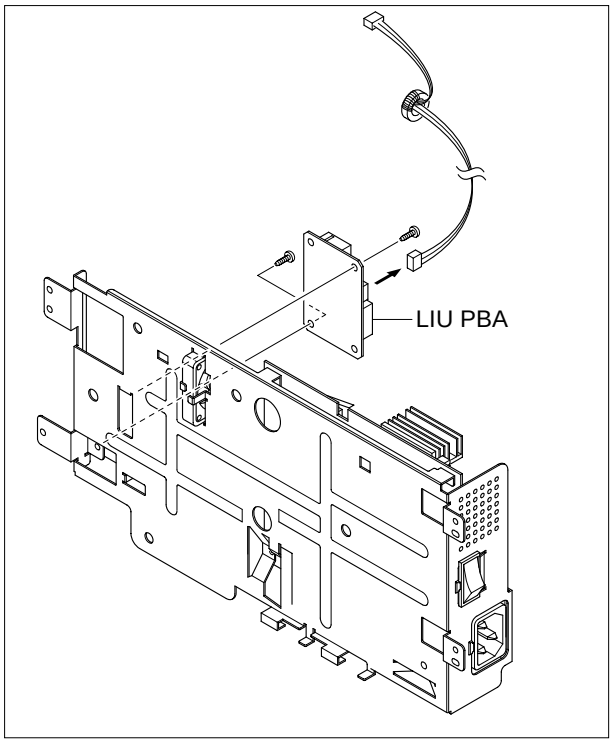
4. Remove the six screws securing the Engine Shield and unplug the DC Fan connector from the Main PBA. Then carefully release the Engine Shield from the Actuator Feed Sensor Lever, as shown below.



5. When if only remove the SMPS, first remove the Rear Cover(refer to the 5.6) and unplug the two Connectors from the SMPS, as shown below. Then remove the six screws securing the SMPS and remove it.



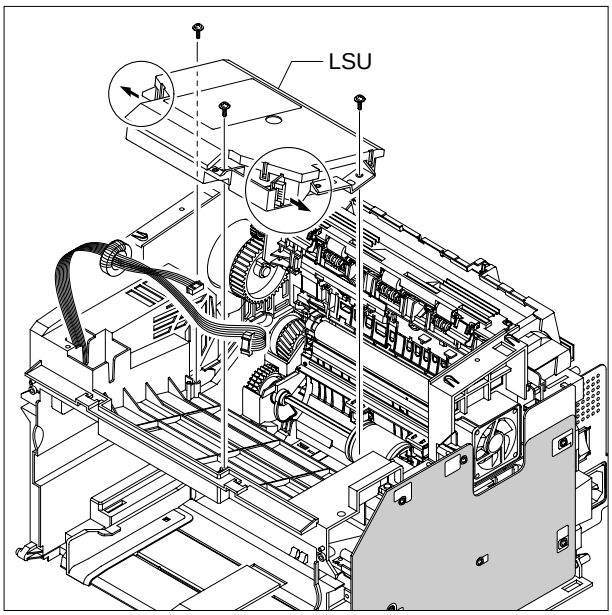
6. When if only remove the LIU PBA, first remove the Rear Cover(refer to the 5.6) and then unplug the connector from the LIU PBA, as shown below. Then remove the two screws securing the LIU PBA and remove it.



5.19 LSU

1. Before you remove the LSU, you should remove:
   - Scan Ass'y (Refer to the 5.9)
   - Middle Cover (Refer to the 5.13)

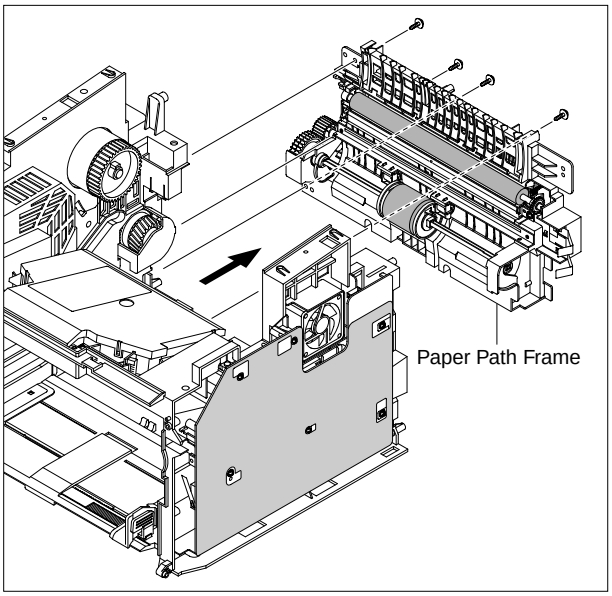
2. Remove the three screws securing the LSU and remove it. Then unplug the two Connectors from the LSU.



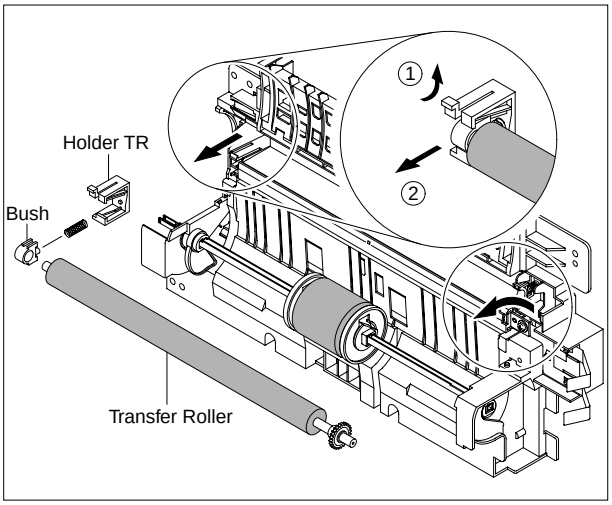
5.20 Paper Path Frame

1. Before you remove the Paper Path Frame, you should remove:
   - Scan Ass'y (Refer to the 5.9)
   - Middle Cover (Refer to the 5.13)
   - Fuser (Refer to the 5.17)
   - Engine Shield (Refer to the 5.18)

2. Remove the four screws securing the Paper Path Frame and remove it, as shown below.

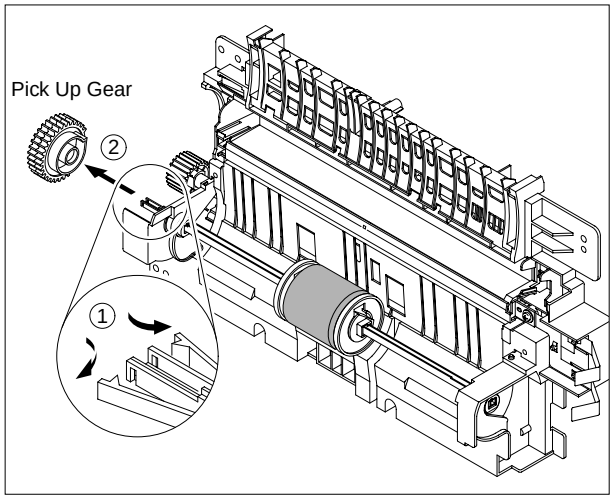


3. To remove the Transfer Roller, first unlatch the lock device of the Holder TR from the Frame and then pull the Transfer Roller(with Holder TR) in the direction of arrow, as shown below.

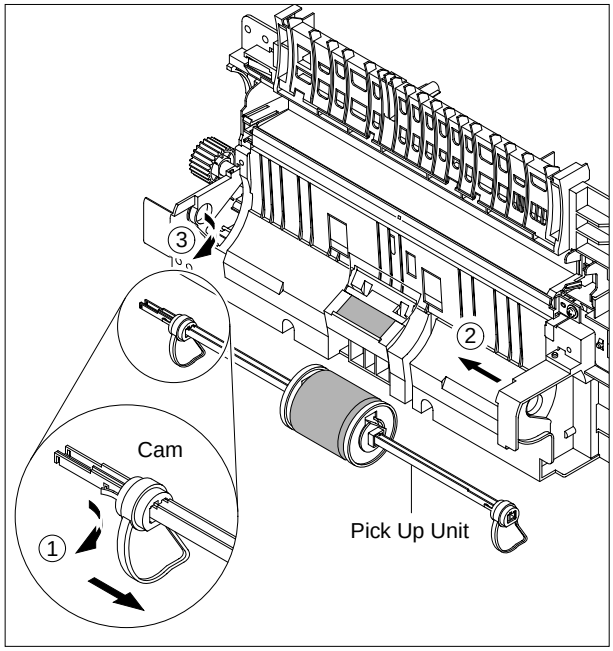


Notice : *Do not grab the rubber part of the Transfer Roller, it may cause a malfunction due to a foreigen object. Holde the both side of the Transfer Roller when replacing it.*

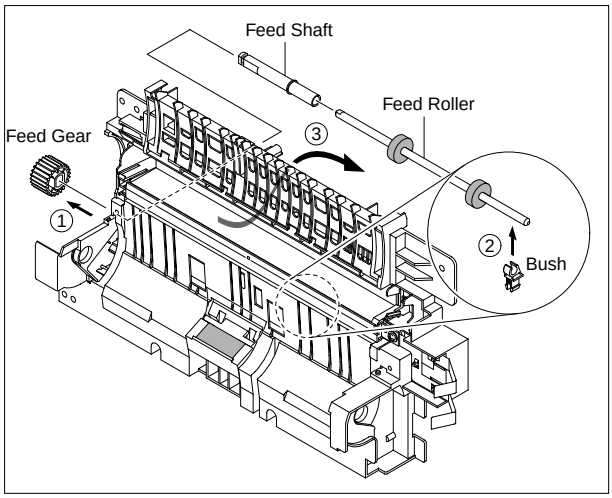
4. Unlatch the lock device of the Pick Up Gear and remove it.



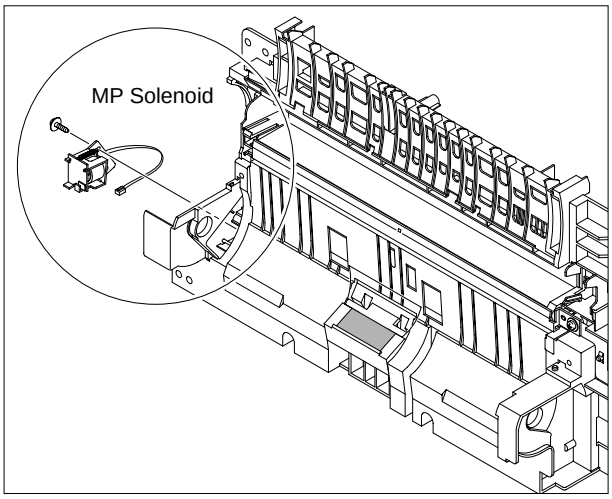
5. To remove the Pick Up Unit, first lift the notch attached to the left side Pick Up Cam so that it's slide the left to right from the Pick Up Shaft, and then slide the Pick Up Unit right side to left side and take out the right side, as shown below.



6. To remove the Feed Roller, first unlatch the lock device of the Feed Gear and remove it. Then pull the Feed Roller from the Bush and take out the Feed Roller(with Feed Shaft) from the Frame in the direction of arrow, as shown below.



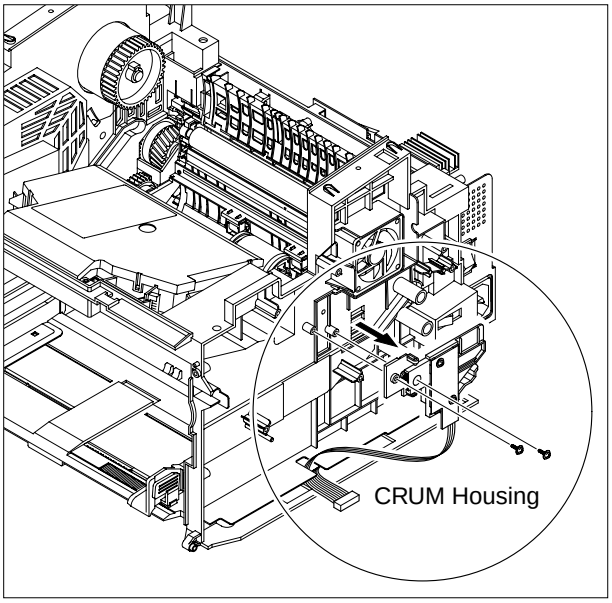
7. Remove the screw securing the MP Solenoid and remove it, as shown below.



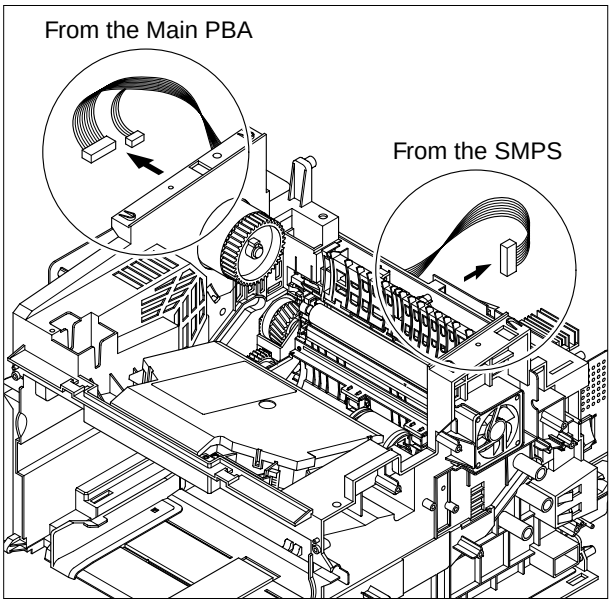
5.21 CRUM Harness

1. Before you remove the CRUM Harness, you should remove:
   - Scan Ass'y (Refer to the 5.9)
   - Middle Cover (Refer to the 5.13)
   - HVPS (Refer to the 5.14)

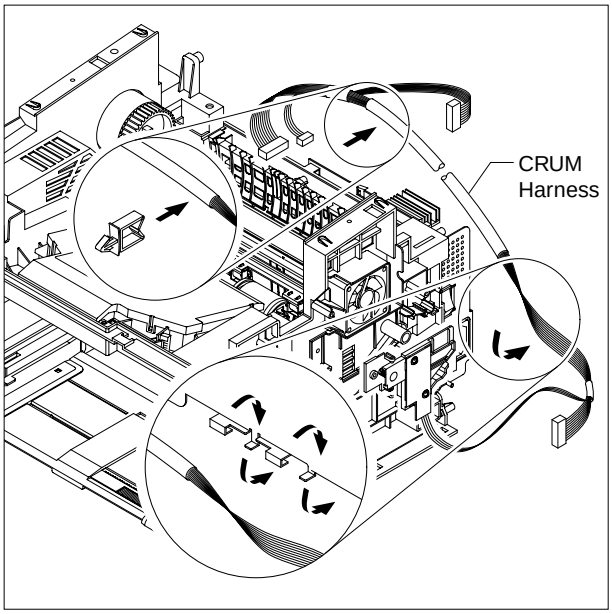
2. Remove the two screws securing the CRUM Hausing and remove it.



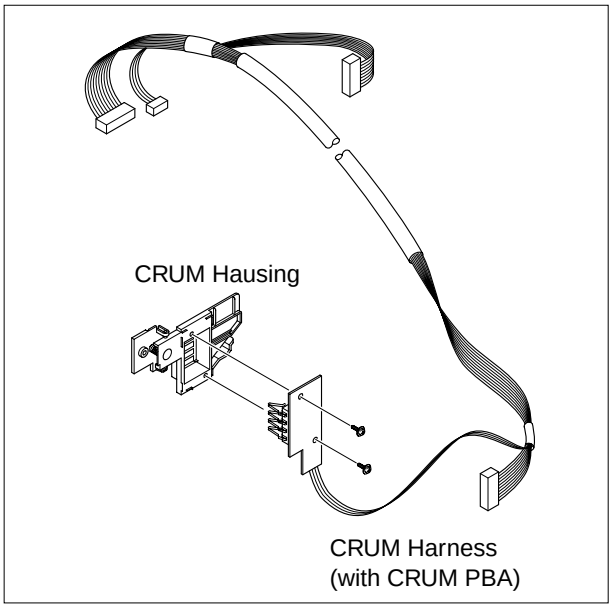
3. Unplug the three connectors from the Main PBA and SMPS, as shown below.



4. Carefully release the CRUM Harness(with CRUM PBA) below the bottom of the Engine Shield in the direction of arrow.

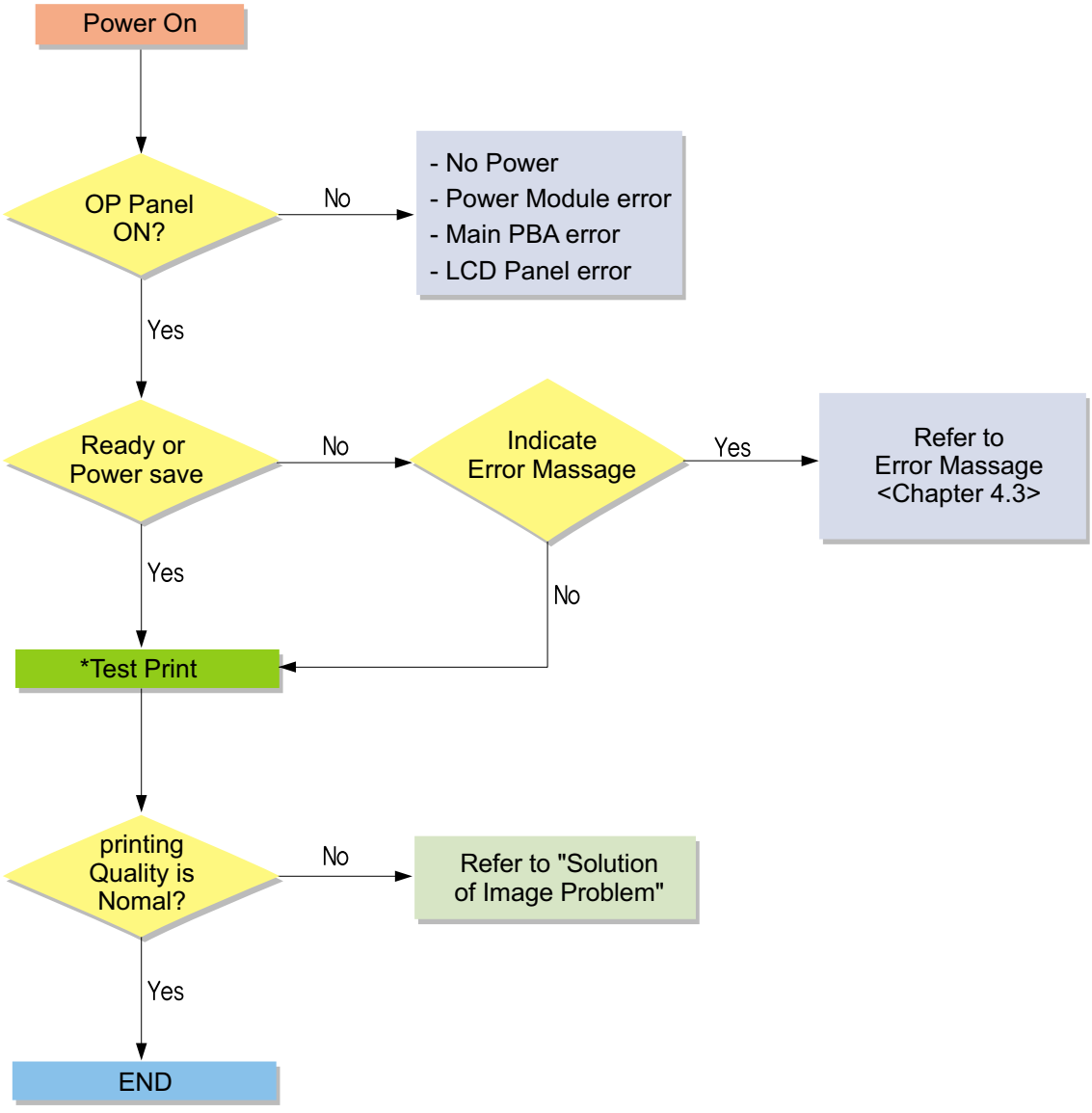


5. If necessary, remove the two screws securing the CRUM PBA and remove it, as shown below.



6. Troubleshooting

Before attempting to repair the printer first obtain a detailed description of the problem from the customer.



* : Only Laser Printer (MFP Not Support)

6.1.1 Basic Check List

1. Check the Power.

• Does "Warming Up" appear on the display?
--> If not check power cable, switch or SMPS.
--> Does the wall socket work?
• Do the Motors or other components initialize (listen for main motor, fan and LSU sounds)?
--> If not or there are none of the normal startup sounds check cable, switch or SMPS.
--> Does the wall socket work?

2. Check the LCD Panel.

• Is there any display at all?
--> If not check power cable, switch or SMPS.
--> Does the wall socket work?
• Is the display a meaningful message care there any broken or badly formed characters?
--> Check the main PBA and cable harness.
• Is the message on the LCD Panel a standard error message?
--> Refer to section 4.3

3. Check the Paper Path

• Is there a Paper Jam?
--> Remove any paper fragments caught in the paper path.
• Paper Jam occurs repeatedly at a specific point in the Paper Path
--> Open the fuser cover, Jam clear.
--> Dismantle the machine and carefully inspect the region where the jam occurs.
(Especially, check if paper fragments are caught in the Fuser

4. Print the Information Page (Configuration).

• Try printing a test page from a computer.
--> If there is an error check cables and driver installation.

5. Check the Print Quality.

•Is there are a Print Quality Problem?
--> Refer to section 6.5

6. Check consumables (toner etc.).

•Using the keys print the Test Pattern.
--> Expected life of various consumable parts, compare this with the figures printed and replace as required

6.1.2 Initial Inspection

1. Check Power part

1. The printer does not work no matter how long you wait.
   A. Is the Power Switch (printer and wall socket) turned on ?
   B. Is the Power Cord connected to the printer correctly ?
   C. Is the Power cord connected to the wall socket correctly ?
   D. Is wall socket working ?
   E. Is the unit rated at the same voltage as the supply ?
2. Does the Fan work when power is turned on?
   A. Check the connectors on the SMPS.
   B. Check the fuses in the SMPS.(F1)

2. Check the Installation Environment.

1. Ensure the installation surface is flat, level and free from vibration.
   If necessary move the printer.
2. Ensure that the temperature and humidity of the surroundings are within specification
   If necessary move the printer.
3. Ensure that the printer is position away from any air conditioning or other heating or cooling equipment. Also ensure that is not positioned in a direct draft from any air conditioning, fan or open window.
   If necessary move the printer.
4. Ensure the printer is not positioned in direct sunlight.
   If it is unavoidable use a curtain to shade the printer.
5. Ensure the printer is installed in a clean dust free environment.
   Move the printer to clean area if necessary.
6. Some industrial or cleaning processes give of fumes which can affect the printer.
   Move the printer away from this type of air pollution

3. Check paper type.

1. Use only paper which is of a suitable quality, weight and size?
   See the user guide.

4. Check the overall condition of the printer

1. Is the printer properly maintained ?
   Clean the Paper Transport Passages.
   Any rollers with dirt surfaces should be cleaned or replaced.

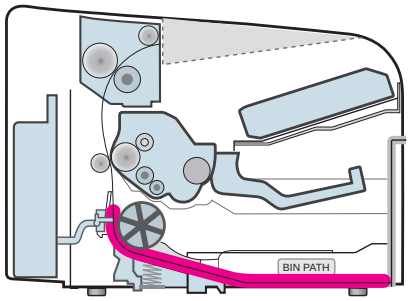
6.2 Bad discharge

6.2.1 Wrong Print Position

• **Description** Printing begins at wrong position on the paper.

Check and Cause	Solution
Wrong sense time caused by defective feed sensor actuator.	Replace the defective actuator

6.2.2 JAM 0

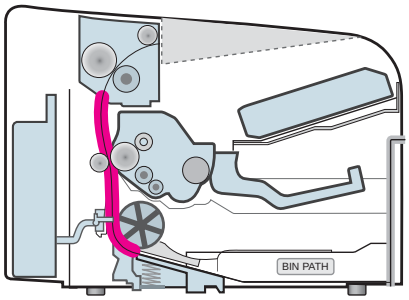


• **Description**

1. Paper is not exited from the cassette.
2. Jam-0 occurs if the paper feeds into the printer.

Check and Cause	Solution
1. Check the Solenoid by using Engine Test Mode-Pick up Test.	1. Replace the solenoid.
2. Check if the pad is loose due to bad sealing of the side-pad.	2. Replace the side-pad Assembly L or R, if necessary.
3. Check the surface of the roller-pickup for foreign matter.	3. Clean with soft cloth dampened with IPA(Isopropyl Alcohol) or water.
4. If the paper feeds into the printer rand Jam 0 occurs, perform Engine Test Mode-Feed Sensor Test.	4. Replace the SMPS, HVPS or Sensor.

6.2.3 JAM 1

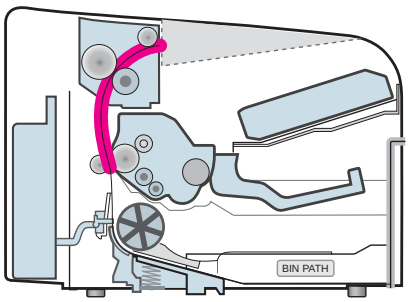


• Description

1. Recording paper is jammed in front of or inside the fuser.
2. Recording paper is stuck in the discharge roller and in the fuser just after passing through the Actuator-Feed.

Check and Cause	Solution
1. If the recording paper is jammed in front of or inside the fuser.	1. Replace the SMPS.
2. If the recording paper is stuck in the discharge roller and the fuser just after passing through the Actuator-Feed, Feed Actuator may be defective.	2. Reassemble the Actuator-Feed and Spring-Actuator if the returning is bad.

6.2.4 JAM 2



• Description

1. Recording paper is jammed in front of or inside the fuser.
2. Recording paper is stuck in the discharge roller and in the fuser just after passing through the Actuator-Feed.

Check and Cause	Solution
1. If the paper is completely fed out of the printer, but Jam 2 occurs : Exit sensor is defective. • After the paper is completely discharged, actuator Exit should return to the original position to shut the photo-sensor. Sometimes it takes longer hour than it should and does not return.	1. Check if the exit sensor actuator is defective. • Check if the actuator exit is unformed (Check if the lever part is unformed in shape). • Check whether burrs occur in the assembly part of the actuator exit or not and if the actuator is smoothly operated. • Check if foreign matters and wire get caught in the actuator exit's operation.
2. If the paper is rolled in the Fuser Roller: • This occurs when a Guide claw is broken away or transformed. • It occurs when the Spring of a Guide claw is broken away or transformed. • It occurs when the Heat-Roller or Pressure-Roller is seriously contaminated with the toner.	2. If the paper is stuck in the fuser : disassemble the fuser and remove the jammed paper, and clean the surface of the pressure roller with dry gauze.
3. Paper is accordion in the fuser.	3. Remove the jammed paper after disassembling the fuser : Clean the surface of the pressure roller with dry gauze. • Remove the toner particles stained on the rib. • Check the assemblage and performance of the exit.

6.2.5 Multi-Feeding

• **Description** Multiple sheets of paper are fed at once.

Check and Cause	Solution
1. Solenoid malfunction(the solenoid does not work properly): Perform Engine Test Mode-Pick up Test.	1. Replace the solenoid if necessary.
2. Pad-Friction is contaminated with foreign matter.(oil...)	2. Clean the pad friction with soft clothe dampened with IPA(Isopropyl Alcohol).
3. The face of paper is blended.	3. Use the smooth paper.

6.2.6 Paper rolled in the Fuser

• **Description** If contaminated at intervals of 57mm on the back of a paper.

Check and Cause	Solution
1. Contamination of the pressure roller or heat roller (Background, Hot off set).	1. After disassembling the fuser, clean contamination between the heat roller and the thermostor and remove the contamination of the pressure roller.
2. Check the claw of the fuser whether it is unfitted.	2. If there is heavy background, repair it by the background troubleshooting method.
	3. The surface of the heat roller with IPA or water
	4. Check the warp or separation of the sprint claw and the holder plate claw, and then manage it.

6.2.7 Paper rolled in the Toner Cartridge (OPC Drum)

• **Description** Paper is rolled up in the OPC.

Check and Cause	Solution
1. Paper is too much thin. 2. The face of paper is curled.	1. Recommend to use normal paper. 2. How to remove the rolled in the OPC Drum. • Remove the paper while turning the OPC Drum against the ongoing direction.

6.3 Set Malfunction – Causes and Solutions

6.3.1 LCD Display Defect (▮▮▮▮in LCD Display)

• **Description** Strange characters are displayed in the LCD Window and OPE Panel buttons do not work.

Check and Cause	Solution
1. Clear the memory. 2. Check that the OPE HARNESS is connected to the Connection Board correctly.	1. Try again after clearing the memory. 2. If re-connecting the harness does not correct the fault replace the OPE Ass'y and the main Board in sequence.

6.3.2 Defective OPE Keypad

• **Description** Pressing keys does not cause the set to respond correctly

Check and Cause	Solution
1. Clear the memory. 2. Check that there is an audible key click when a key is pressed.	1. Check that the keypad is assembled correctly and the membrane is not damaged, replace the membrane or whole keypad assembly if necessary. 2. If the fault remains replace the OPE Ass'y and the Main board in sequence.

6.3.3 Fuser gear melts due to overheating causing Paper Jam.

• Description	Constant Jam where paper is entering Fuser unit. Fuser rollers do not turn

Check and Cause	Solution
1. Check the Heat Lamp, thermostat and thermistor	1. Use Engine Test Mode to test the Fuser -THERM ADC 120. Replace Fuser unit Replace SMPS or Main PBA as appropriate.

6.3.4 Paper Empty

• Description	Paper Empty is displayed in the LCD panel even when paper is loaded in the cassette.

Check and Cause	Solution
1. Deformed paper sensor actuator or faulty sensor. 2. SMPS PBA or Main PBA is defective 3. Faulty cables or connectors.	1. Replace the defective actuator or sensor. 2. Replace the SMPS PBA or MAIN PBA as appropriate.

6.3.5 Paper Empty without indication

• Description	The paper empty message does not appear in the LCD when the paper cassette is empty.

Check and Cause	Solution
1. Deformed paper sensor actuator or faulty sensor. 2. SMPS PBA or Main PBA is defective .	1. Replace the defective actuator. 2. Replace the SMPS PBA or MAIN PBA as appropriate

6.3.6 Cover Open

• **Description** The Cover Open message appears on the LCD even when the print cover is closed.

Check and Cause	Solution
1. The 'Open Cover' microswitch may be stuck or faulty	1. Use TECH mode("cover sensor test") to check cover switch operation. Check and replace switch if necessary.
2. The tab on the front cover may be damaged or broken	2. Replace the front cover.
3. Check the connector and cables between HVPS and main PBA.	3. Replace the Main Control board or HVPS as necessary.

6.3.7 No error message when the cover is open

• **Description** The Cover Open message does not appears on the LCD even when the print cover is open.

Check and Cause	Solution
1. The 'Open Cover' microswitch may be stuck or faulty	1. Use TECH mode("cover sensor test") to check cover switch operation. Check and replace switch if necessary.
2. Check the connector and cables between HVPS and main PBA.	2. Replace the Main Control board or HVPS S/W as necessary.

6.3.8 Defective motor operation

• **Description** Main motor is faulty and paper does not feed into the printer, resulting in Jam 0'

Check and Cause	Solution
1. The main motor harness or Motor PCB may be faulty.	1. Check the motor harnesses and connectors, replace if defective.. If the problem persists replace the main PBA. **Note** Check motor operation using Engine Test Mode.

6.3.9 No Power

• **Description** When system power is turned on the LCD panel does not come on.

Check and Cause	Solution
1. Check if the power input and SMPS output are normal.	1. Replace the power supply cord or SMPS. Check power fuse and SMPS fuses replace if necessary.
2. LCD panel does not come on but normal start up sounds are heard.	2. Replace the OP panel.
3. After replacing SMPS display does not come on and no start up sounds are heard.	3. Replace the main PBA.

6.3.10 Printed Vertical Lines become curved

• **Description** When printing, vertical lines are not straight.

Check and Cause	Solution
1. Check stability of 24V supply to LSU.	1. 24V stable - Replace LSU. 24V unstable replace SMPS, if the problem persists replace the main PBA.

6.4 Bad Software Environment

6.4.1 The printer is not working (1)

• **Description** While Power turned on, the printer is not working in the printing mode.

Check and Cause	Solution
1. Run Self-Test Mode : Turn the power on and pressing "System Data List" by pressing Menu-Reports-System Data.	1.Check the power of the printer and perform the Self-Test. If the test printing works, that means no problems in the printer itself. If the test printing does not work, that means bad functioning of the printer(not because of software).
2. Check if the PC and the printer is properly connected and the toner cartridge installed.	2. Replace the printer cable. If the problems not solved even after the cable replaced, check the amount of the remaining toner.
3. Printing is not working in the Windows.	3. Check if the connection between PC and printer port is proper. If you use windows, check if the printer driver in the controller is set up. If the printer driver is properly set up, check in which program the printing is not working. The best way to find out is to open the memo pad to check the function of printing. If it is not working in a certain program, adjust the setup the program requires. Sometimes, the printout is normal within the Windows basic programs, but it's not working in a particular program. In such case, install the new driver again. If not working in the Windows basic program, Check the setup of the port of CMOS is on ECP. And check the address of IRQ 7 and 378
4. Check if the printer cable is directly connected to peripheral devices	4. If the scanner needs to be connected to the printer, first the remove the scanner from the PC to see if the printer is properly working alone.

6.4.2 The printer is not working (2)

• Description After receiving the printing order, no response at all or the low speed of printing occurs due to wrong setup of the environment rather than malfunction of the printer itself.

Check and Cause	Solution
1. Secure more space of the hard disk.	1. Not working with the message 'insufficient printer memory' means hard disk space problem rather than the RAM problem. In this case, provide more space for the hard disk. Secure more space using the disk utilities program.
2. Printing error occurs even if there is enough space in the hard disk.	2. The connection of the cable and printer port is not proper. Check if the connection is properly done and if the parallel port in CMOS is rightly set up.
3. Check the parallel-port-related items in the CMOS Setup.	3. As a printer port, Select ECP or SPP among SPP(Normal), ECP, and EPP modes(increase printing speed) SPP normal mode support 8-bit data transfer, while ECP Mode transfer the 12-bit data.
4. Reboot the system to print.	4. If the regular font is not printing, the cable or the printer driver may be defective. Turn the PC and printer off, and reboot the system to print again. If not solved, double-click the printer in my computer If the regular fonts are not printed this time again. the cable must be defective so replace the cable with new one.

6.4.3 Abnormal Printing

• **Description**	The printing is not working properly even when the cable has no problem. (even after the cable is replaced) If the printer won't work at all or the strange fonts are repeated, the printer driver may be defective or wrong setup in the CMOS Setup.

Check and Cause	Solution
1. Set up the parallel port in the CMOS SETUP.	1. Select SPP(Normal) or ECP LPT Port the among ECP, EPP or SPP in the CMOS Setup.
2. Printer Driver Error.	2. Check the printer in My Computer.(to see if the printer driver is compatible to the present driver or delete the old driver, if defective and reinstall the new driver)
3. Error message from insufficient memory. (The printing job sometimes stops or due to insufficient virtual memory, but it actually comes from the insufficient space of the hard disk.)	3. Delete the unnecessary files to secure enough space of the hard disk and start printing job again.

6.4.4 SPOOL Error

• **Description**	To spool which stands for "simultaneous peripheral operations online" a computer document or task list (or "job") is to read it in and store it, usually on a hard disk or larger storage medium so that it can be printed or otherwise processed at a more convenient time (for example, when a printer is finished printing its current document).

Check and Cause	Solution
1. Insufficient space of the hard disk in the directory assigned for the basic spool.	1. Delete the unnecessary files to provide more space to start printing job.
2. If the previous printing error not solved.	2. If there are some files with the extension name of ****.jnl, Delete them and Reboot the Windows to restart printing job.
3. When expected to collide with other program.	3. Shut down all other programs except the current one, if possible.
4. When an application program or the printer driver is damaged.	4. Delete the printer driver completely and reinstall it.
5. When some files related to OS are damaged or virus infected.	5 After rebooting the computer, check for viruses, restore the damaged files and reinstall the program to do the printing job.
6. Memory is less than suggested one.	6. Add up enough memory to the PC.

⚠ How to delete the data in the spool manager.

In the spool manager, the installed drivers and the list of the documents waiting to be printed are shown. Select the document to be deleted and check the delete menu.

If you intend to delete the current document being printed, the data being transferred to the printer will be put out and then the document is removed. Before choosing the document, the menu is still inactive.

Or put the document out of the list and repeat the routine as in the above or finish the spool manager.

6.5 Bad image

6.5.1 Vertical Black Line and Band

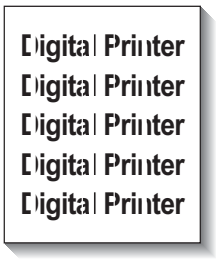
• Description

1. Straight thin black vertical line occurs in the printing.
2. Dark black vertical band occur in the printing.

Check and Cause	Solution
1. Damaged develop roller in the Developer. Deformed Doctor-blade or cleaning-blade.	1. If causes 1 and 2 occur in the developer cartridge, replace the developer and try to print out.
2. Scratched surface of the discharge roller in the developer.	2. Replace the transfer roller if occurred as No. 3.
3. Partly depression or deformation on the surface of the transfer roller.	

6.5.2 Vertical White Line

• Description White vertical voids in the image.

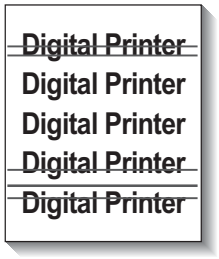


Check and Cause	Solution
1. Foreign matter stuck onto the window of internal lenses of LSU mirror.	1. Foreign matter stuck onto the window : Clean the LSU window with recommended cleaner(IPA) Clean the window with a clean cotton swab.
2. Foreign matter or toner particles between the developer roller and blade. (In case the life of the developer has been expired, white lines or light image occur in front of the image.)	2. Foreign matter in the LSU : Open the cover of LSU and clean with a cotton swab on the surface of the reflex mirror.
3. It may occur when Burr and foreign substances are on the window of the developer frame.	3. No 3. : Remove the foreign matter and burr of the exposure window. (Developer cartridge)
4. If the fuser is defective, voids occur periodically at the top of a black image.	4. No. 4. : Open the front cover and check ribs that corresponds to the position of the voids. Remove if found.
	5. If the problems are not solved, replace the developer cartridge.

6.5.3 Horizontal Black Band

• Description

1. Dark or blurry horizontal stripes occur in the printing periodically. (They may not occur periodically.)



Check and Cause	Solution
1. Bad contacts of the voltage terminals to developer.	1. Clean each voltage terminal of the Charge, Supply, Develop and Transfer roller. (remove the toner particles and paper particles)
2. The rollers of developer may be stained. OPC Drum = 75.5mm Charge Roller = 37.7mm Supply Roller = 47.5mm Develop Roller = 35.2mm Transfer Roller = 46.2mm Heat Roller = 63.9mm Pressure Roller = 75.4mm	2. Clean the right Gear that has relatively small gap of the teeth in the OPC. 3. If the malfunction persists, replace the developer.

6.5.4 Black/White Spot

• Description

1. Dark or blurry black spots occur periodically in the printing.
2. White spots occur periodically in the printing.

Check and Cause	Solution
1. If dark or blurry black spots occur periodically, the rollers in the Developer may be contaminated with foreign matte or paper particles. (Charge roller : 37.7 mm interval OPC drum : 75.5 mm interval)	1. Run OPC cleaning Mode Print and run the Self-test 2 or 3 times.
2. If faded areas or voids occur in a black image at intervals of 75.5 mm, or black spots occur elsewhere, the OPC drum surface is damaged.	2. In case of 75.5 mm interval unremovable in 1, cleanly remove foreign substances stuck on the OPC location equivalent to black spots and white spots with a dry duster.
3. If a black image is partially broken, the transfer voltage is abnormal or the transfer roller's life has expired.	3. The transfer roller guarantees 50.000 sheets printing. If the roller's life is expired, replace it. 4. In case of 37.7 mm interval unremovable in 1, take measures as to replace the developer cartridge and try to print out. 5. Clean the inside of the set against the paper particles and foreign matter in order not to cause the trouble.

6.5.5 Light Image

• **Description** The printed image is light, with no ghost.

Digital Printer
Digital Printer
Digital Printer
Digital Printer
Digital Printer

Check and Cause	Solution
1. Develop roller is stained when the toner of developer cartridge is almost consumed.	1. Check if the Toner Save mode is off.
2. Ambient temperature is below than 10°C.	2. Replace the developer cartridge and try to print out.
3. Bad contact caused by the toner stains between the high voltage terminal in the HVPS and the one in the set.	3. Wait 30 minutes after printer is powered on before you start printing.
4. Abnormal output from the HVPS.	4. Clean up the contaminated area by the toner.
	5. Replace the HVPS if the problems are not solved by the above four directions.

6.5.6 Dark Image or a Black

• **Description** The printed image is dark.

Check and Cause	Solution
1. No charge voltage in the engine board.	1. Clean the high voltage charge terminal.
2. Charge voltage is not turned on due to the bad contacts between power supply in the side of the Developer and charge terminal of HVPS.	2. Check the state of the connector which connects the engine board and HVPS.
	3. Replace the HVPS if not solved by the above direction 1 and 2.

6.5.7 Uneven Density

• **Description** Print density is uneven between left and right.

Digital Printer
Digital Printer
Digital Printer
Digital Printer
Digital Printer

Check and Cause	Solution
1. The pressure force on the left and right springs of the transfer roller is not even, the springs are damaged, the transfer roller is improperly installed, or the transfer roller bushing or holder is damaged.	1. Replace both the left and right Spring Holder.
2. The toner level is not even on the developer roller due to the bad blade.	2. Occur in the developer cartridge, replace the developer and try to print out.

6.5.8 Background

• **Description** Light dark background appears in whole area of the printing.

Digital Printer
Digital Printer
Digital Printer
Digital Printer
Digital Printer

Check and Cause	Solution
1. Does character exist less than 2% per a page, and hasn't it been used long time?	1. The toner cartridge is basically designed to print 3,000 sheets with 5% image.
2. Does recycle paper be used?	2. The B/S is not guaranteed if using recycle paper.
3. Has the life span of the developer ended?	3. Replace the developer when the life span of it has been ended.
4. Is the movement(Up and Down) of the transfer roller smooth?	4. Clean the bushing part of the transfer roller.
5. Is the HVPS normal?	5. If the problem is still not solved, replace the developer.

6.5.9 Ghost (1)

• **Description** Ghost occurs at 75.5 mm intervals of the OPC drum in the whole printing.

Check and Cause	Solution
1. Bad contacts caused by contamination from toner particles between high voltage terminal in the main body and the electrode of the Developer.	1. Clean the terminals when contaminated by toner particles.
2. Bad contacts caused by contamination from toner particles between high voltage terminal in the main body and the one in the HVPS board.	2. Occur in the developer cartridge, replace the developer and try to print out.
3. The life of developer is expired.	3. Replace the Main board and HVPS Board if not solved by the above directions 1-2.
4. Transfer roller lifetime(50.000 sheets) has expired.	4. If not solved by the direction 3, check the transfer roller lifetime and replace it.
5. Abnormal low temperature(below 10°C).	5. Wait about 1 hour after power on before using printer.

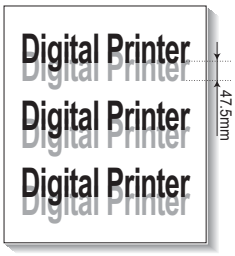
6.5.10 Ghost (2)

• **Description** Ghost occurs at 75.5 mm intervals of the OPC drum in the whole printing.
(When printing on card stock or transparencies using manual feeder)

Check and Cause	Solution
When printing on card stock thicker than normal paper or transparencies such as OHP, higher transfer voltage is required.	Select 'Thick Mode' on paper type menu from the software application and after using returning to the original mode is recommended.

6.5.11 Ghost (3)

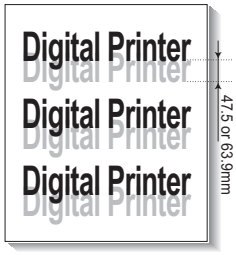
• **Description** White ghost occurs in the black image printing at 47.5mm intervals.



Check and Cause	Solution
1. The life of the developer may be expired.	1. Occur in the developer cartridge, replace the developer and try to print out.
2. The abnormal voltage and bad contact of the terminal of the supply roller	2. Check the approved voltage of the supply roller and contact of the terminal and adjust if necessary.

6.5.12 Ghost (4)

• **Description** Ghost occurs at 47.5mm(or 63.9mm) intervals.



Check and Cause	Solution
The temperature of the fuser is maintained high.	1. Disassemble the fuser and remove the contaminated toner particles on the roller and clean the foreign matter between Thermistor and Heat roller. (⚠ Caution : can be deformed)

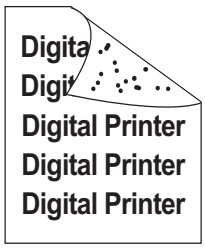
6.5.13 Stains on the Face of Page

• **Description** The background on the face of the printed page is stained.

Check and Cause	Solution
1. Toner leakage due to improperly sealed developer.	1. Replace the developer cartridge.
2. If the transfer roller is contaminated, stains on the face of page will occur.	2. If the transfer roller is contaminated, run DRUM Cleaning Mode Print 2 or 3 times. And perform Self-Test 2 or 3 times to remove contamination.

6.5.14 Stains on Back of Page

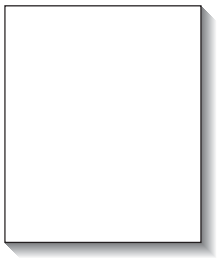
• **Description** The back of the page is stained at 47 mm intervals.



Check and Cause	Solution
1. Transfer roller is contaminated.	1. Perform the DRUM Cleaning Mode Print 2 or 3 times. Run Self-Test to remove the contamination of the transfer roller.
2. Pressure roller is contaminated.	2. Replace the transfer roller if contaminated severely.
	3. Disassemble the fuser and clean the H/R(Heat Roller) and P/R(Pressure roller). And check the area between H/R and Thermistor. If contaminated, clean the area not to be deformed.

6.5.15 Blank Page Print out (1)

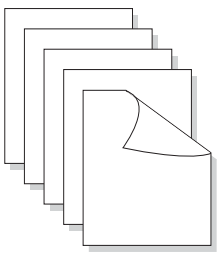
• **Description** Blank page is printed.



Check and Cause	Solution
Bad ground contacts in OPC and/or developer.	Remove contamination of the terminals of the developer and the unit.

6.5.16 Blank Page Print out (2)

• **Description**
1. Blank page is printed.
2. One or several blank pages are printed.
3. When the printer turns on, several blank pages print.



Check and Cause	Solution
1. Bad ground contacts in OPC and/or developer.	1. Remove contamination of the terminals of the developer.
2. Abnormal solenoid.	2. Perform the engine self test using Engine Test Mode to check if the Solenoid is normal.(refer to code 06)
	3. If not solved by the above directions 1-2, Replace the engine board.
	4. Turn the power off, delete the data of PC and try printing again.

6.6 Fax & Phone Problems

6.6.1 No Dial Tone

• **Description** There is no dial tone when the On-Hook dial button is pressed.

Check and Cause	Solution
1. Check that the telephone line cord supplied with the set is connected to TEL LINE correctly.	1. If the telephone cord is OK but there is no dial tone, try plugging a normal telephone into the wall socket. If this is OK then replace the LIU B'd.
2. Listen for a CLICK sound when the OHD key is pressed.	2. If you cannot hear the OHD CLICK sound, the OPE Ass'y may be defective. Replace the OPE Ass'y. (If the key click sound if off, you cannot hear click sound even if OPE Ass'y has no problem on it)
3. Check the connection of the HARNESS between the LIU and the Main B'd.	3. Check the Speaker connection and the harness between the LIU and the Main PBA, replace as necessary.
4. Check that the SPEAKER is connected correctly.	4. Use Tech mode / Modem Test to check that the speaker and amplifier are working. Replace the Main B'd.

6.6.2 Defective MF DIAL

• **Description** The MF DIAL is not functioning.

Check and Cause	Solution
1. Check that the telephone line cord supplied with the set is connected to TEL LINE correctly.	1. If the telephone cord is OK but there is no dial tone, try plugging a normal telephone into the wall socket. If this is OK then replace the LIU B'd.
2. Listen for a CLICK sound when the KEY is pressed.	2. If you cannot hear the OHD CLICK sound, the OPE Ass'y may be defective. Replace the OPE Ass'y. (After key click sound sets to “ON”, and you can hear click sound)
3. Check the connection of the HARNESS between the LIU and the Main B'd.	3. Check the Speaker connection and the harness between the LIU and the Main PBA, replace as necessary.
4. Check that the SPEAKER is connected correctly.	4. Use Tech mode / Modem Test to check that the speaker and amplifier are working. Replace the LIU and Main B'd in sequence **Notes:** Product supports MF DIAL type only.

6.6.3 Defective FAX FORWARD/RECEIVE

• **Description** FAX FORWARD/RECEIVE is not functioning.

Check and Cause	Solution
1. Check that you can hear a dial tone by pressing OHD.	1. If MODEM testing is normal and there is no dial tone, then try replacing the LIU B'd.
2. Check that you can hear a RECEIVE tone when MODEM testing in TECH Mode.	2. If testing the MODEM shows a fault replace the Main B'd.

6.6.4 Defective FAX FORWARD

• **Description** RECEIVE is functioning, but FORWARD is not functioning or received data is corrupt.

Check and Cause	Solution
1. Check if there is a NOISE line by pressing on-hook dial and listening.	1. If you can hear a noisy line when using on-hook dial, replace or repair the telephone line
2. Check that the destination fax machine can receive forwarded faxes by using a different sending fax machine (preferably from the same wall socket).	2. Replace LIU.
3. Check the cable between the set and the wall socket for damage.	3. Replace the line cord.

6.6.5 Defective FAX RECEIVE (1)

• **Description** FORWARD is functioning, but RECEIVE is not functioning or the received data is corrupt.

Check and Cause	Solution
1. Check if there is a NOISE line by pressing on-hook dial and listening 2. Use a different fax machine to receive from the same sender (if possible on the same wall socket).	1. If you can hear a noisy line when using on-hook dial, replace or repair the telephone line. 2. Replace the LIU.

6.6.6 Defective FAX RECEIVE (2)

• **Description** Received data are lengthened or cut in the printing.

Check and Cause	Solution
1. Check if there is a NOISE line by pressing on-hook dial and listening 2. Ask sender to send to another fax machine (if possible connected to the same wall socket)	1. If you can hear a noisy line when using on-hook dial, replace or repair the telephone line 2. Replace LIU or main PBA in sequence.

6.6.7 Defective FAX RECEIVE (3)

• **Description** The phone is ringing continuously, but it set does not answer the call.

Check and Cause	Solution
Check that the RECEIVE Mode is set to FAX MODE.	If the fault persists even when the RECEIVE Mode is changed to FAX MODE then replace the LIU and the Main B'd in sequence.

6.6.8 Defective FAX RECEIVE (4)

• **Description** Received data is reduced by more than 50% in the printing.

Check and Cause	Solution
Check the FAX status of the forwarding side.	This is a problem with the sending fax machine. Correct the setting on the remote machine..

6.6.9 Defective Automatic Receiving

• **Description** The automatic receiving function is not working.

Check and Cause	Solution
1. Check that the RECEIVE Mode is set to FAX MODE.	1. If the RECEIVE Mode is set to the TEL MODE, reset it to the FAX MODE. 2. Even after the RECEIVE Mode is changed to the FAX Mode, the problem persists then try to replace the LIU and the Main B'd in sequence.

6.7 Copy Problems

6.7.1 White Copy

• **Description** Blank page is printed out when copying.

Check and Cause	Solution
1. Check the Scanner Cover is properly closed.	1. Room light can pass through a thin original.
2. Check shading profile.	2. Redo shading profile in the tech mode.
3. Check white/black reference voltage on Main PBA.	3. Replace the Main PBA.

6.7.2 Black Copy

• **Description** Black page is printed out when Copying.

Check and Cause	Solution
1. Check for CIS problem on the Main PBA.	1. Check the CIS FFC Cable is properly connected.
2. Check shading profile.	2. Redo shading profile in the tech mode.

6.7.3 Abnormal noise

• **Description** There is noise from the ADF when copying.

Check and Cause	Solution
1. Check the Scanner Motor, gearbox and rollers.	1. Check for correct assembly of gears and motor. Ensure no parts are fouling and there are no foreign objects in the mechanism or scanner path. Replace any worn parts
2. Check the Motor Driver on Driver PBA.	2. Replace the main PBA and ADF PBA in seguence.

6.7.4 Defective Image Quality

• **Description** The copied image is excessively light or dark

Check and Cause	Solution
1. Check shading profile.	1. Redo shading profile in the tech mode.
2. Check the gap between original and scanner glass.	2. A gap of more than 0.5 mm can cause a blurred image. Ensure rollers and cover close correctly. Replace as necessary.
3. Check printing quality.	3. See "Print" troubleshooting.

6.8 Scanning Problems – Causes and Solutions

6.8.1 PC Scanning problems

• **Description** Unable to scan using a PC.

Check and Cause	Solution
1. Check the Cable (USB or Parallel) is properly connected and that the printer can print correctly.	1. Reconnect the PC and printer, replace any faulty cables. If using a parallel cable, check that the parallel port is properly configured in the BIOS.
2. Check that the driver is installed properly.	2. If printing is OK check that the Scan driver is also installed (Refer to User's Manual.)
3. Check that the copy function operates normally.	3. If the copy function works, replace the Main PBA. If the copy function doesn't work, replace the CIS Ass'y and try again.

6.8.2 Poor Quality of PC Scanned images

• **Description** The image PC scanned is not clear or bad.

Check and Cause	Solution
1. Use TECH mode to carry out a shading test and examine the waveform printout.	1. If the CIS waveform form is abnormal replace the CIS Ass'y.
2. Check if the resolution is set too low in PC Scan options. (Refer to User's Manual.)	2. Teach the user about scanner resolution – refer to the User Guide.

6.9 Toner Cartridge Service

Only toner cartridges supplied by Samsung should be used. Printing defects or set damage caused by the use of non-approved toner cartridges or un-licensed toner refills are not covered by the guarantee.

6.9.1 Precautions on Safe-keeping of Toner Cartridge

Excessive exposure to direct light for more than a few minutes may cause damage to the cartridge.

6.9.2 Service for the Life of Toner Cartridge

If the printed image is light due to the toner supply becoming low you can temporarily improve the print quality by redistributing the toner (Shake the toner cartridge), however you should replace the toner cartridge to solve the problem permanently.

6.9.2.1 Redistributing Toner

When the toner cartridge is near the end of its life, white streaks or light print occurs. The LCD displays the warning message, “Toner Low.” You can temporarily reestablish the print quality by redistributing the remaining toner in the cartridge.

6.9.3 Standard of guarantee for consumable parts.

Please refer to User's Manual or Instructions on Fax/Printer Consumables SVC manual for the criteria for judging the quality of consumable parts the standard of guarantee on those parts.

- **Spotting a refilled cartridge by eye.**
  One way security screws are used in the manufacture of the cartridge – check if these are damaged.

6.9.4 Error messages in the LCD window related to toner.

This section explains messages on the LCD that are related to the data stored in the EEPROM in the toner cartridge.

6.9.4.1 Toner Low

- Explanation: The amount of toner remaining is less than 10%
- Solution: The cartridge is almost empty or life-expired – replace the cartridge.

6.9.4.2 Toner Empty

- Explanation: The toner cartridge is empty
- Solution: Replace the cartridge.

6.9.4.3 Drum Warning

- Explanation: This message appears when the OPC drum is nearing the end of its life (14,000pages). This means that the life of the mechanical parts in the cartridge has expired (this is not an indication of toner remaining).
- Solution: After printing about 15,000 pages, in a worst case scenario, the waste toner collector might overflow and it may cause the system to fail. Also after 15,000 pages the OPC drum surface will be becoming worn and print quality will degrade, print images will become misty. It is therefore necessary to replace the cartridge even though there may be toner left in it.
  When this message occurs there are approximately 1,000 pages left.

6.9.4.4 Replace Drum

- Explanation: The toner cartridge mechanical life is expired.
- Solution: Replace the cartridge.

6.10 Software Problems – Causes and Solutions

6.10.1 The printer is not working (1)

• **Description** While Power turned on, the printer is not working in the printing mode.

Check and Cause	Solution
1. Run Self-Test Mode: using the menu buttons print the test page.	1. If the test print works that means there are no problems in the printer itself. If the test printing does not work that means the printer is faulty and the problem is not due to computer software or driver settings.
2. Check that the PC and the printer are properly connected and that the toner cartridge installed correctly.	2. Replace the printer cable. If the problem is not solved even after the cable is replaced, check the amount of the remaining toner. (refer to Toner Cartridge Service 7-6, Page 7-25)
3. Printing is not working in the Windows.	3. Check that the connection between PC and printer port are correcct. If you use windows, check that the printer driver in the controller is set up correctly set up, the correct port is selected and 'Use On-line' is selected in the driver. If the printer driver is properly set up try printing a test page from the driver properties. Check in which program printing is not working. Try opening 'Note Pad' and printing. If the printer is not working in a certain program, adjust the setup within that program. Sometimes, the printout is normal within the Windows basic programs, but it's not working in a particular program. In this case, uninstall and re-install the new driver. If the printer is not working in the Windows basic programs and you are printing using the parallel port check the port setting in CMOS is on ECP and that the address is IRQ 7 and 378 (for parallel port 1). Try using USB instead of parallel – or vice versa.
4. Check that the printer cable is directly connected to the printer.	4. If you have other devices that need to share the printer port try temporarily disconnecting these devices and perhaps even uninstalling their drivers) to ensure the printer works by itself. If you are using a USB hub try connecting directly to the back of the PC instead.

6.10.2 The printer is not working (2)

• Description After receiving the print command there is no response at all or print speed is low due to wrong setup of the environment rather than malfunction of the printer itself.

Check and Cause	Solution
1. Ensure you have sufficient free hard disk space for the temporary work files created during printing.	1. Not working with the message 'insufficient printer memory' means there is a hard disk space problem rather than a printer RAM problem. In this case provide more space on the hard disk. Secure more space using the disk utilities program.
2. Printing error occurs even if there is enough space in the hard disk.	2. The connection of the cable and printer port is not correct. Check that the cable is properly connected and if you are using the parallel port check that the port settings in CMOS is correct.
3. Check the parallel-port-related items in the CMOS Setup.	3. For the printer port, Select ECP. SPP and normal normal modes support 8-bit data transfer, while ECP Mode supports 12-bit data transfer.
4. Reboot the system to print.	4. If the regular font is not printing, the cable or the printer driver may be defective. Turn the PC and printer off, and reboot the system to print again. If not solved, double-click the printer in my computer If the regular fonts are not printed this time again. the cable must be defective so replace the cable with new one.

6.10.3 Abnormal Printing

• **Description** Printing does not work – even after replacing the cable
Printer does not work at all or strange fonts are printed,

Check and Cause	Solution
1. Set up the parallel port using CMOS SETUP.	1. Ensure that ECP (best) or SPP is selected in the CMOS (BIOS) setup.
2. Printer Driver Error.	2. Ensure that the correct driver is loaded. Use the driver supplied on the CD or downloaded from the Samsung web site. DO NOT use the Microsoft driver supplied with the Windows operating system. If the printer is a GDI or SPL type printer ensure that ALL OTHER GDI or SPL drivers are uninstalled as Windows allows only 1 of this type of driver to be loaded.
3. Error message “insufficient memory”. (The printing job sometimes stops due to insufficient virtual memory, this is caused by insufficient space on the hard disk.)	3. Delete any unnecessary files to secure enough space on the hard disk and start the print job again.

6.10.4 SPOOL Error

• **Description**	SPOOL (simultaneous peripheral operations online) is the process Windows uses to manage print jobs. Jobs are processed and then stored on the hard disk until the printer is ready to accept them

Check and Cause	Solution
1. Insufficient space on the hard disk in the directory assigned for the basic spool.	1. Delete any unnecessary files to provide more space for spool storage.
2. If previous printing errors were not solved.	2. There may be files from previous failed print jobs on the hard disk with the name in the form '*.jnl'. Delete these files and Reboot Windows to restart the printer.
3. There may be conflict with other drivers or programs.	3. Shut down all other programs except the current one, if possible.
4. When an application program or the printer driver is damaged.	4. Delete the printer driver completely and reinstall it.
5. When some files related to the OS are damaged or virus infected.	5 After rebooting the computer, check for viruses, restore the damaged files and reinstall the application program which is not working properly.
6. Memory is less than suggested.	6. Add up more memory to the PC.

⚠ How to delete the data in the spool manager.

In the spool manager, the installed drivers and the list of the documents waiting to be printed are shown.

Select the document to be deleted and check delete in the menu.

If the job you are deleting is the current job when you delete the job data that has already been transferred to the printer's memory will still be printed. If there is a problem with the printer (out of toner, offline, out of paper etc.) the job may take a long time to delete as it must wait for a time out.

6.11 Windows Problems

Problem	Solution
After installing PortThru the print server name is not displayed under New Print Server in SyncThru.	1. Verify that the printer power switch is turned on and the 'READY' message is displayed on the printer front panel. 2. Verify that the LAN cable is plugged into the PortThru card. 3. There are 2LEDs on the PortThru card. One should flash irregularly and the other should be on. If this is not the case ensure that the network card is properly installed and the PCB an cable connectors make a good connection. If the problem continues check the network cable / socket by using a different cable or socket. If the problem continues replace the network card. 4. Confirm that the print server and the PC which searches for the New Print Server is on the same LAN (correct IP and subnet mask settings). If you want to search for a New Print Server your PC and the print server should be on the same LAN.
The print server name is displayed, but the test page is not printed.	Using the front panel menus print the Network configuration. If the Network menu is not displayed or the configuration page is not printed turn off the printer, ensure the network card is properly fitted then turn it back on and try again. If the problem continues replace the network card.
SyncThru indicates that firmware upgrade is complete but when the network configuration is printed the software version has not changed.	Before attempting to upgrade firmware ensure that computer and printer can communicate using a Ping command.
SycThru is unable to automatically detect the printer.	1. Check that the LAN cable is connected to the printers. If an IP address is assigned to the computer and printer ensure that the Ping command can see the printer. If an IP address is not allocated to the printer or it is in a different LAN segment then ensure that either IPX/SPX or DLC/LLC protocols are enabled on the computer. 2. Print the network configuration. If the TCP/IP or Network protocols are disabled in the printer either use the front panel to re-enable them or ensure that DLC/LLC protocol is installed in the computer. 3. In SyncThru use the Settings / Protocol Selection menu option to select either TCP/IP or IPX protocols and then use the View/Refresh option to scan the network again. 4. Ensure that the network cable and wall socket are functioning correctly. 5. Ensure that the version of SyncThru is the same as or newer than the version supplied with the printer. 6. Ensure that there is no router between the printer and the computer as SyncThru will not work through a router. 7. Ensure there are no Switch or Router VLAN or Access Control Lists which are blocking communication between the printer and the computer. ***Note*** *Windows XP does not support DLC/LLC protocols.*
The printer does not print via a network connection.	1. Connect the printer using a Parallel or USB cable and ensure that the computer can print. If not check that the printer drivers are installed correctly 2. If the printer can print via a local connection check Printer Properties / Ports and ensure that a TCP/Ip port has been allocated to the printer.

6.12 SyncThru Installation Problems

Problem	Solution
"File Transfer Error" message appears during the Installation process.	1. Make sure that any previously installed version of SyncThru is uninstalled. Restart your PC after uninstalling previous versions. 2. If the problem continues, In Windows 95/98 boot into MS/DOS mode and delete the "sammon.dll" file in the windows\system directory the restart Windows and reinstall SyncThru. In Windows NT stop the spooler service using' Services 'in Control Panel, delete the "sammon.dll" file in the windows\system32 directory then restart the spooler service and reinstall SyncThru.
'Unable to add the Port list of Samsung ports' message appears when you add a port.	Verify that your PC restarts after installing SyncThru.

7. Exploded Views and Parts List

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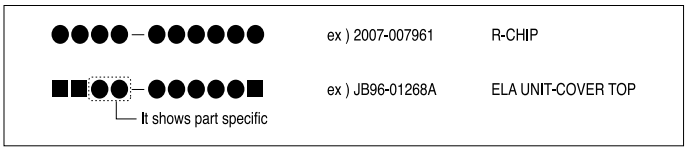
Way to observe Part Code & Description

Part code and Description is quoted and controlled by determined standard. Refer to this determined standard, it will help with ordering Part.

• **There are two kinds of Part code inscription type.**



(● : figure, ■ : character (alphabet))

Type 1 : Controlled by Company : It can be commonly used for all kinds of product SEC produce. Mostly, electronics Parts.

Type 2 : Controlled by Division : It is used or one produce. Mostly, Mostly, mechanical Parts.

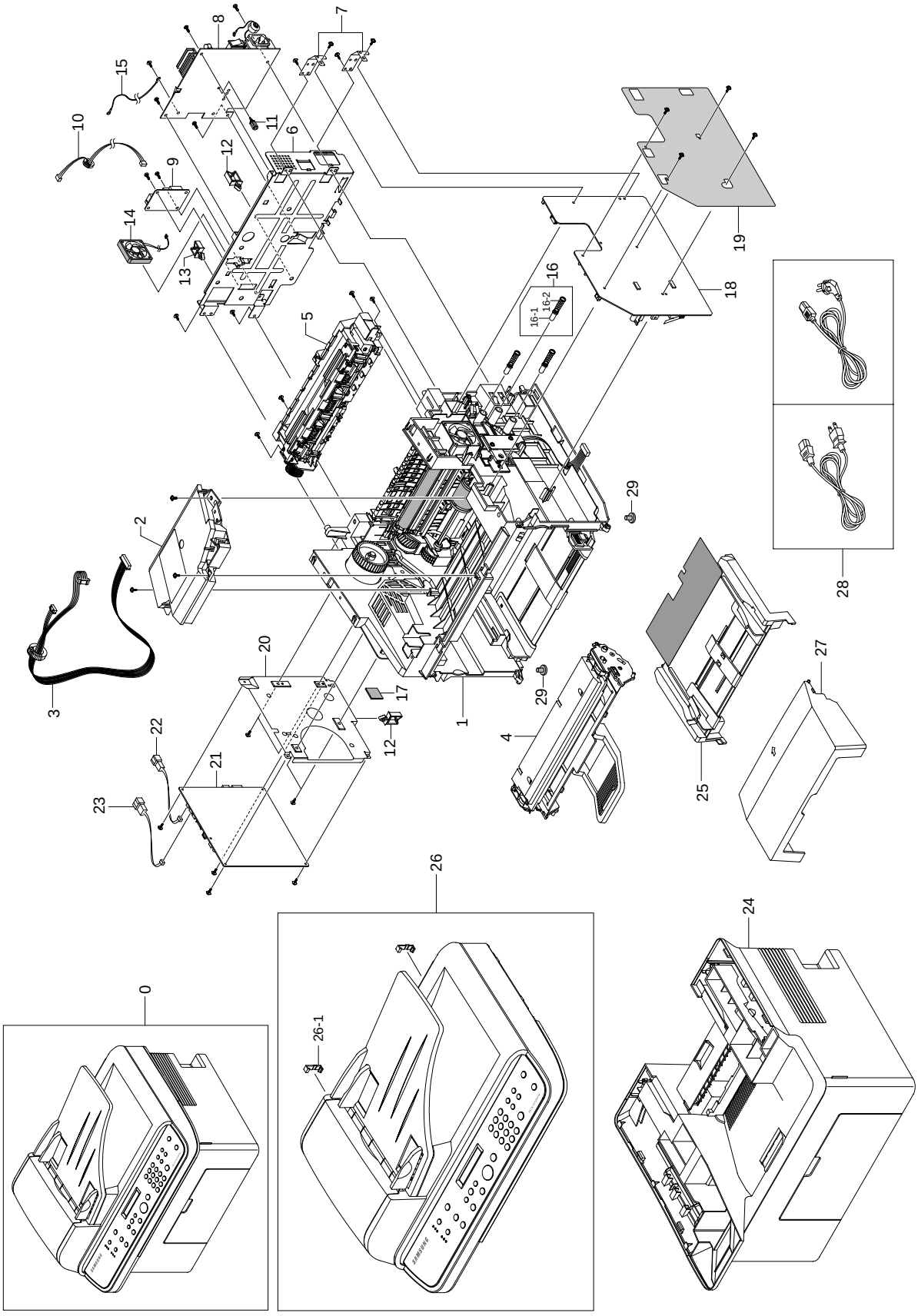
• **A/S privately used part :** It is only used for A/S .

• **Ass'y part :** Assembled by more than 2 Parts. If necessary part is not A/S Part, Ass'y part including necessary par can be used. It is shown in the diagram and drawing of SVC manual.

• Ass'y part and A/S privately used Part is distinguished by part Code and Description.
The are inscription type 2. It is recognized by Part character and front side of description.

DIVISION	PART CODE	DESCRIPTION
A/S Private	**81-****** (JB81-00039A)	AS-***** (AS-USE)
ASS'Y Part	**75-****** (JB75-00068A)	MEC-***** (MEC-CHUTE)
ASS'Y Part	**92-****** (JB92-01131A)	PBA ****** (PBA MAIN-CONTROLLER)
ASS'Y Part	**97-****** (JB97-01089A)	MEA ****** (MEA UNIT-PULLEY IDLE)

7.1 Main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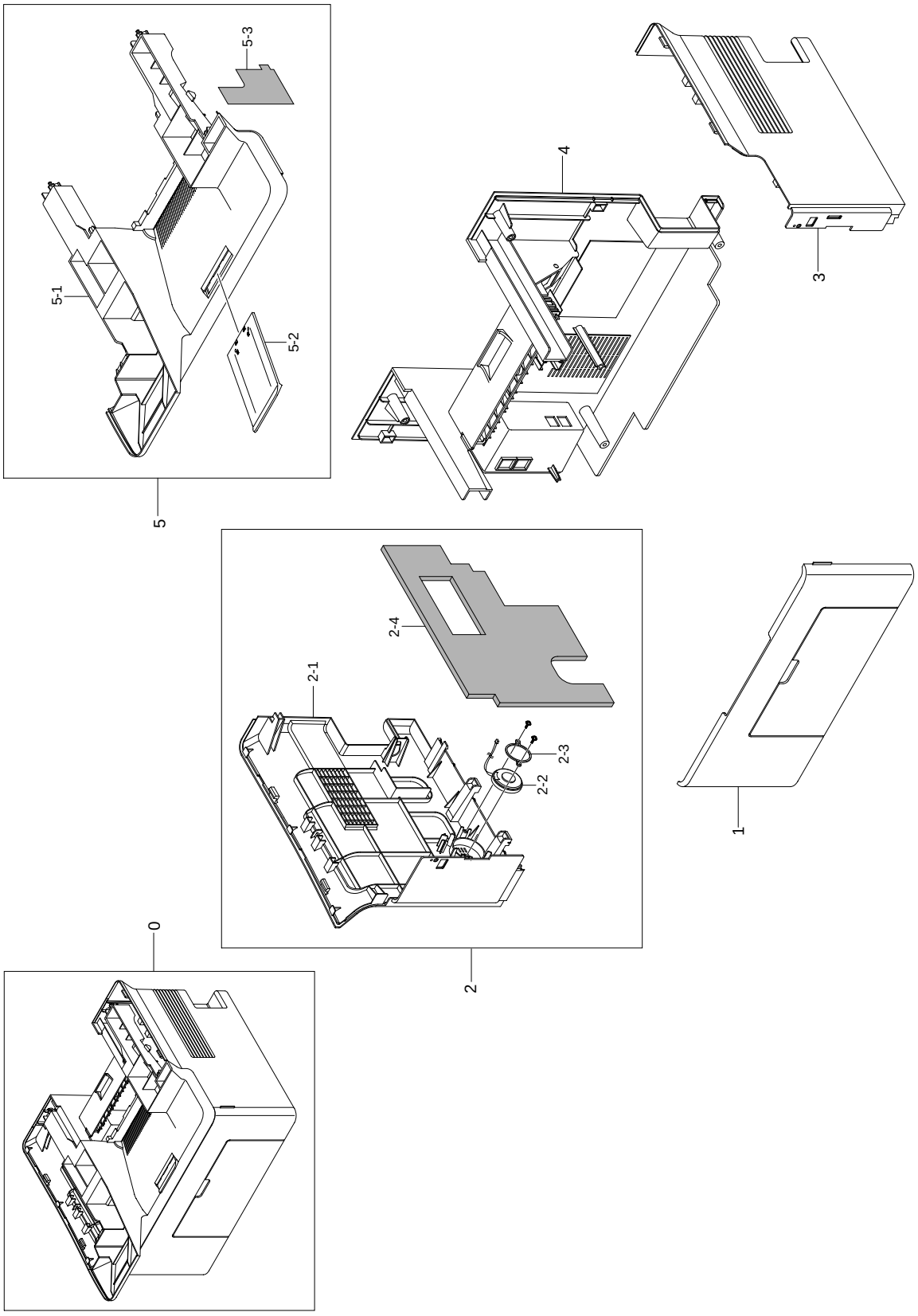
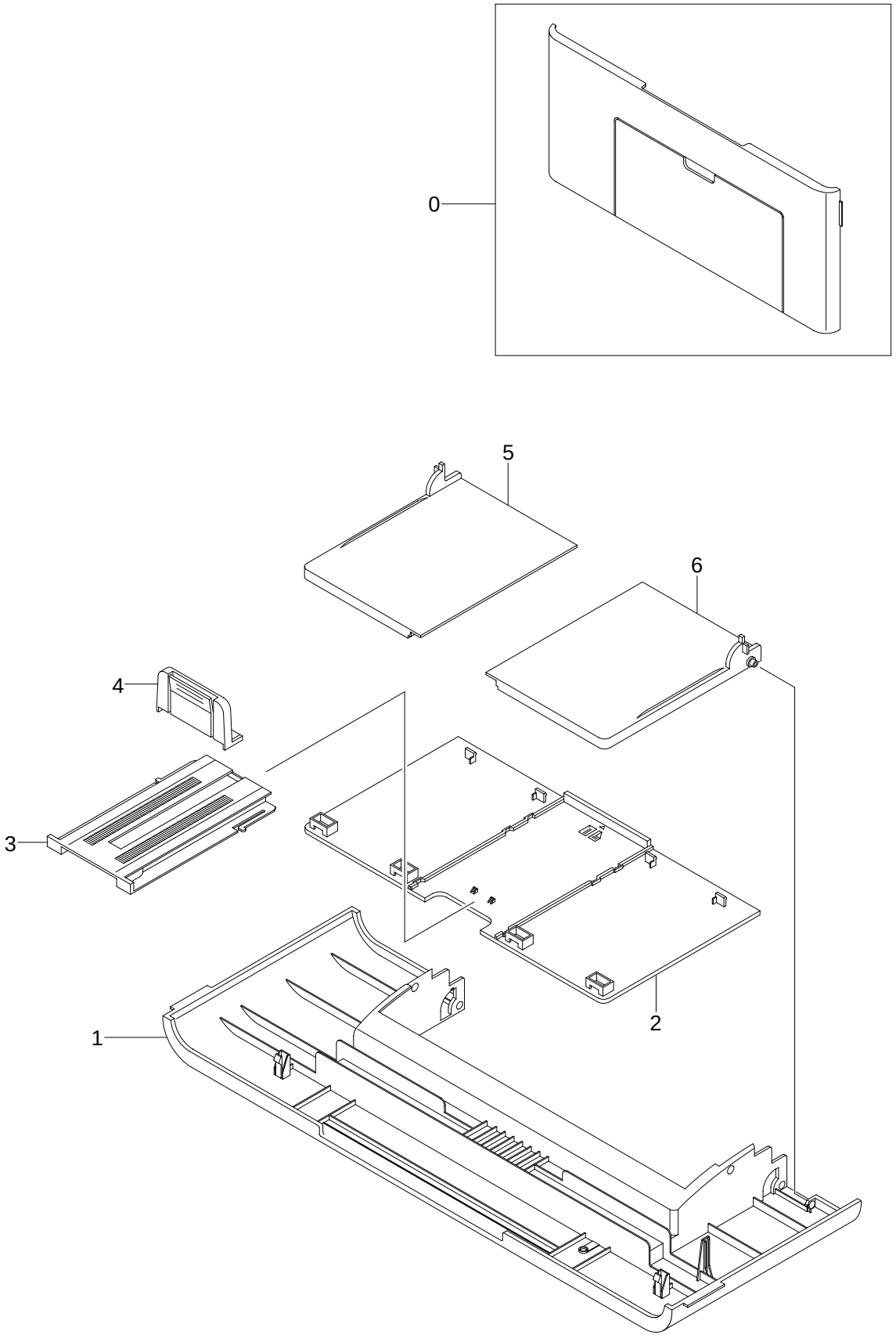
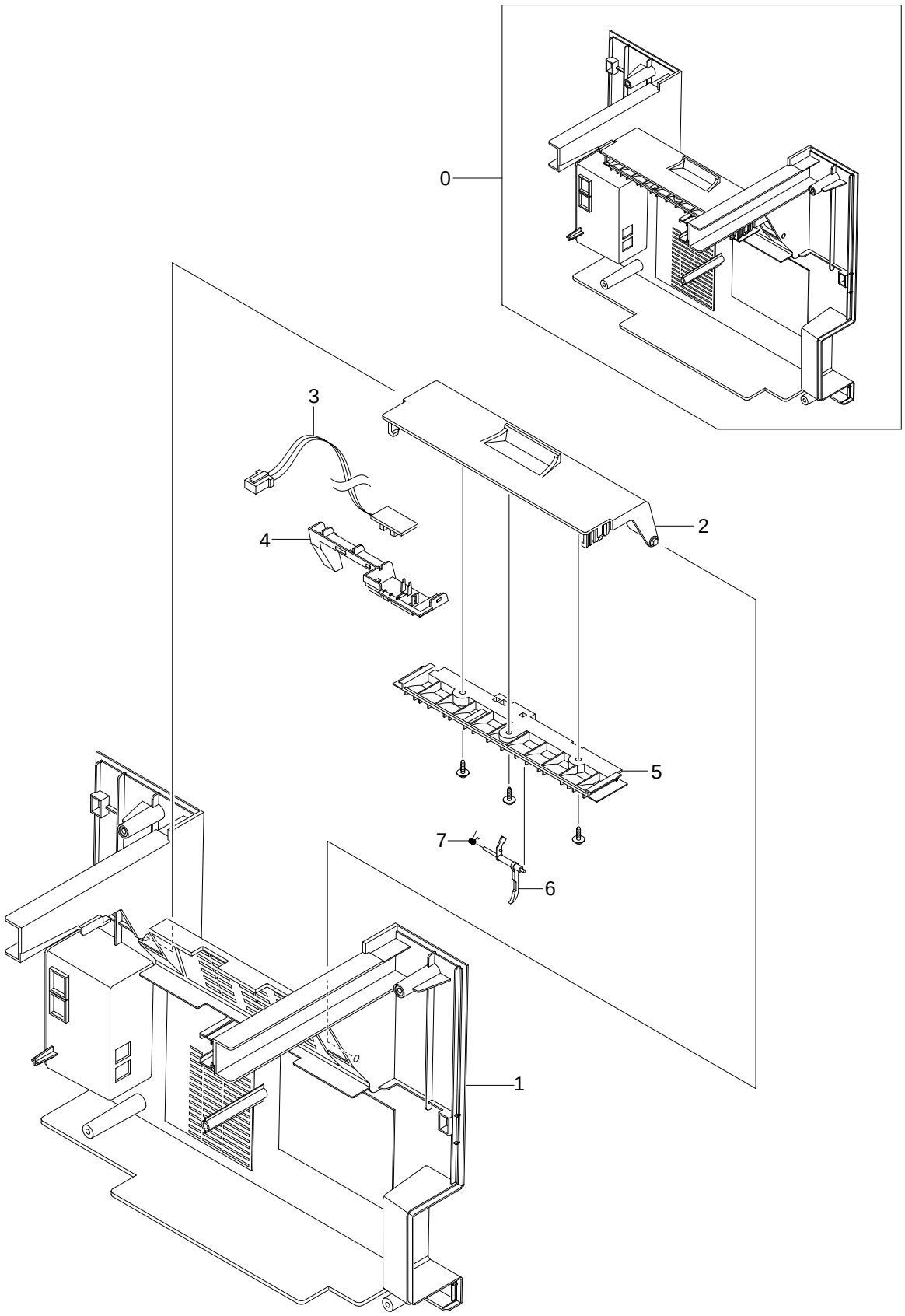
7.2 Cover Housing



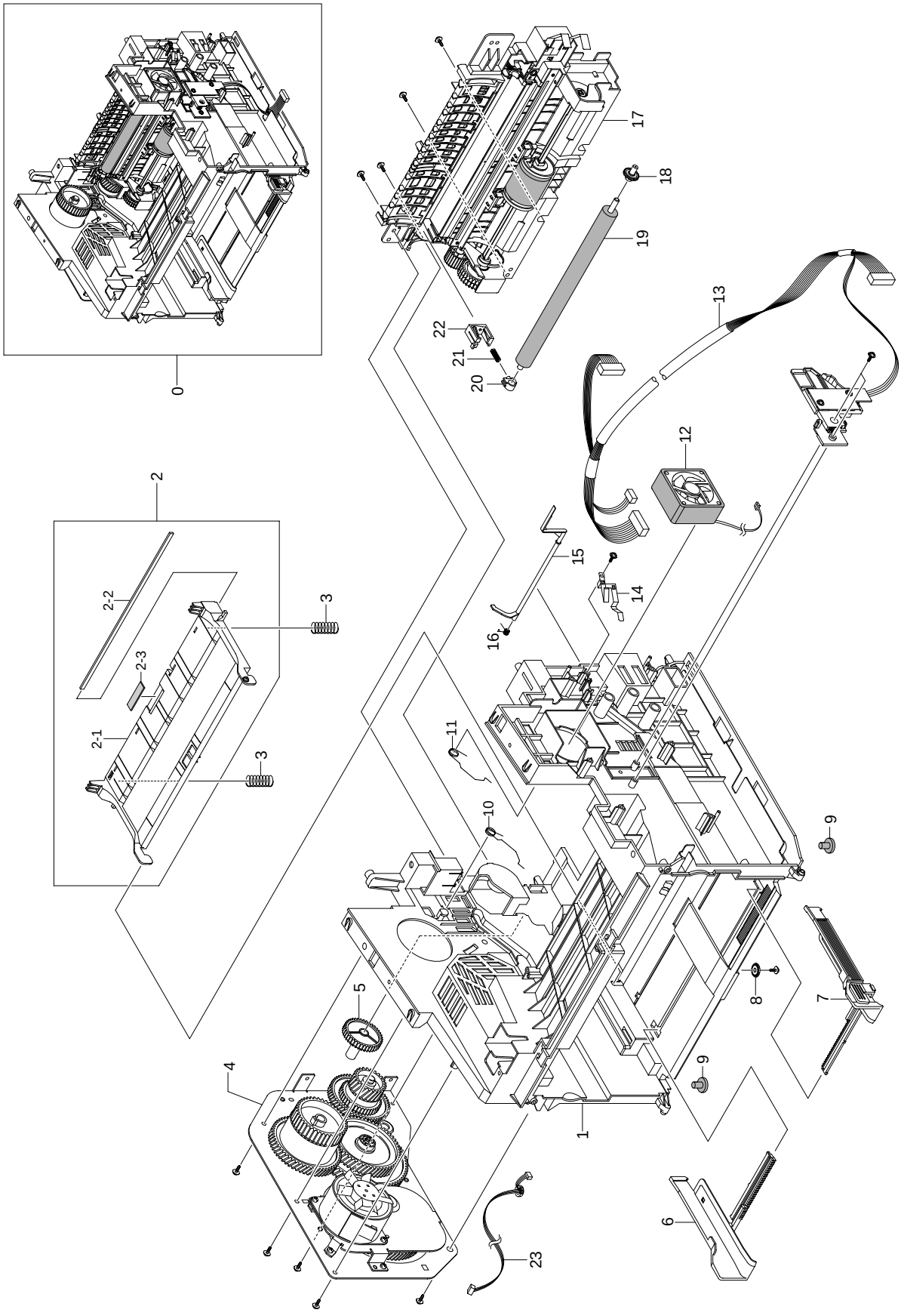
7.3 Front Cover



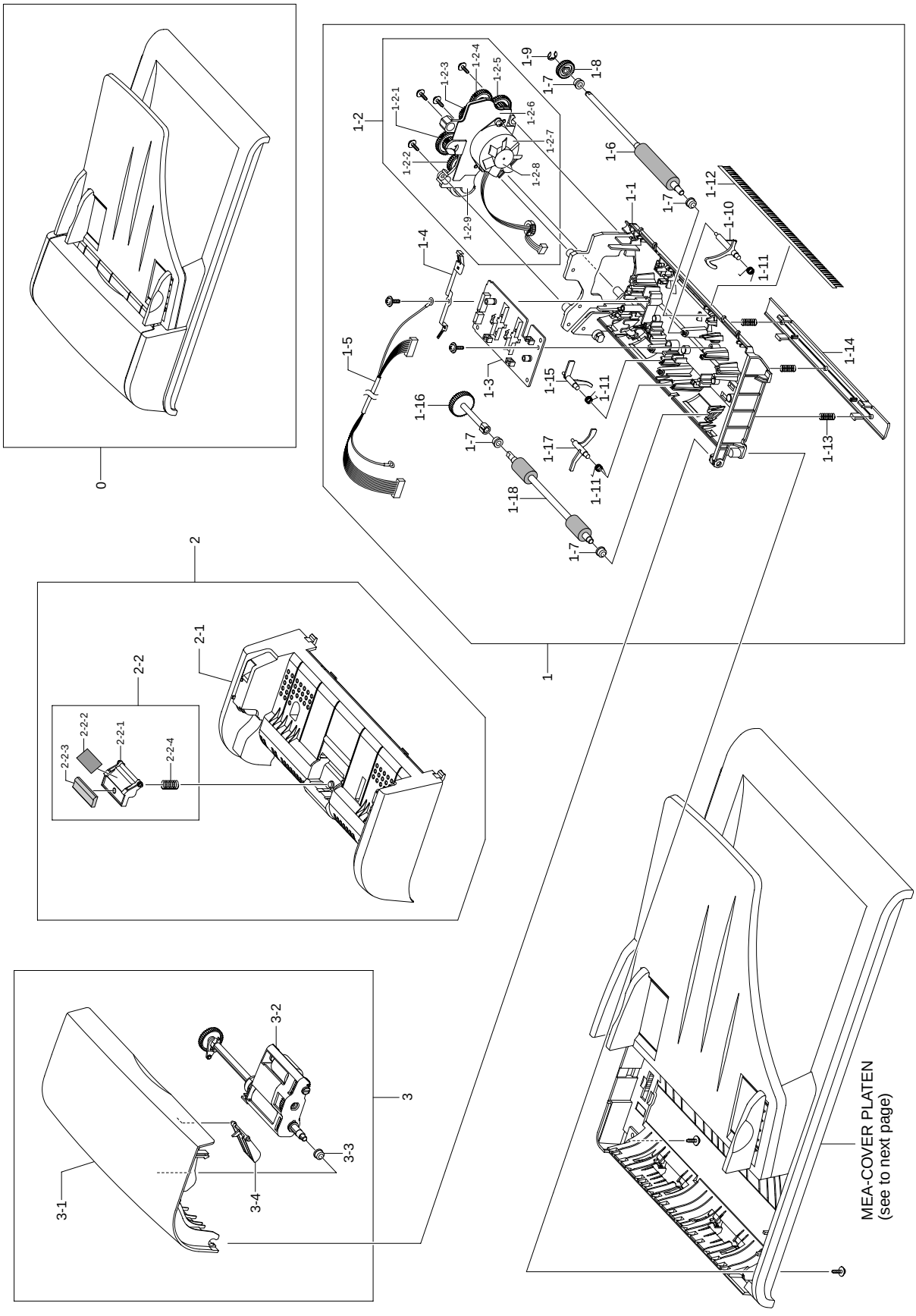
7.4 Rear Cover



7.5 Frame Ass'y



7.6 ADF Ass'y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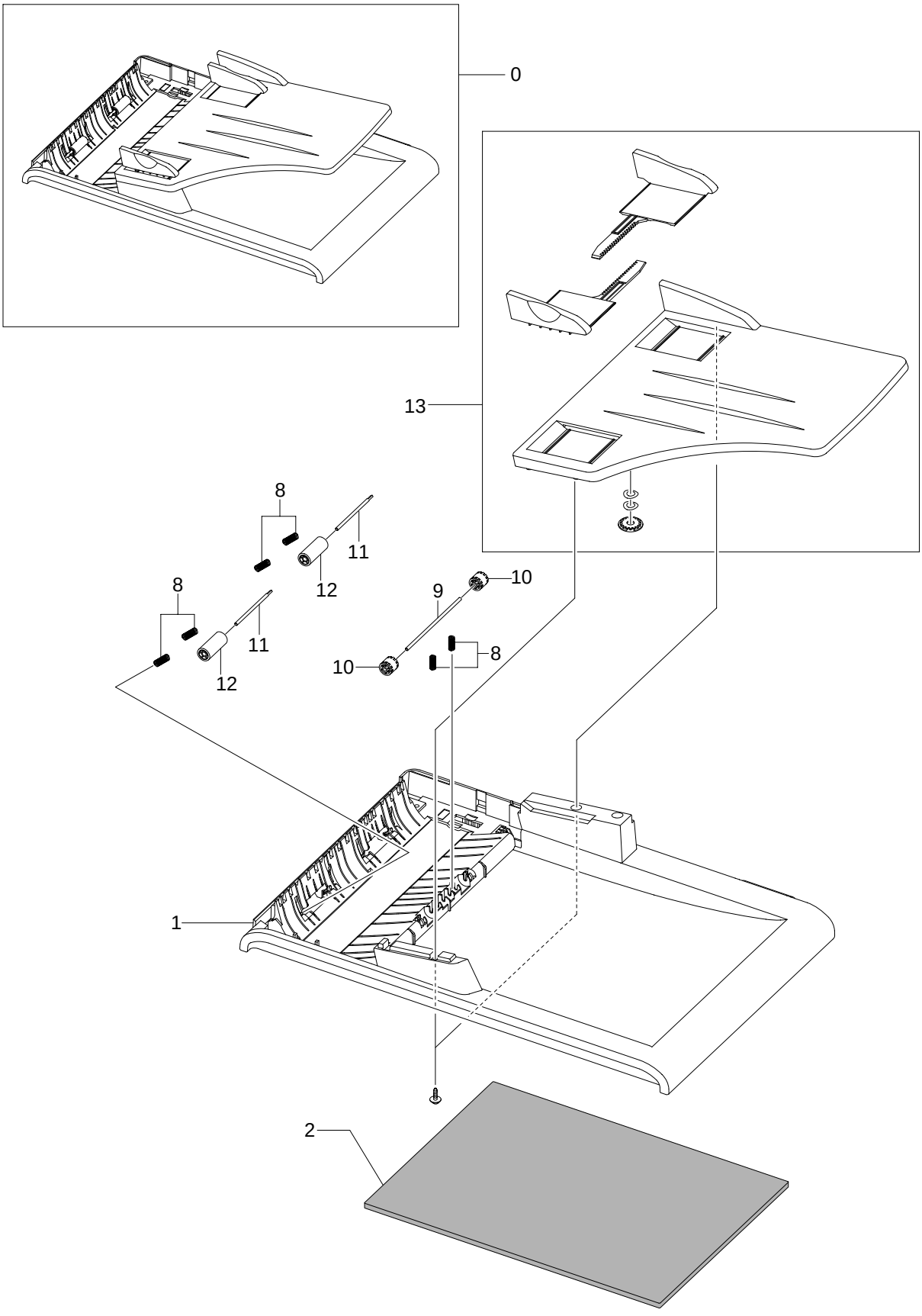
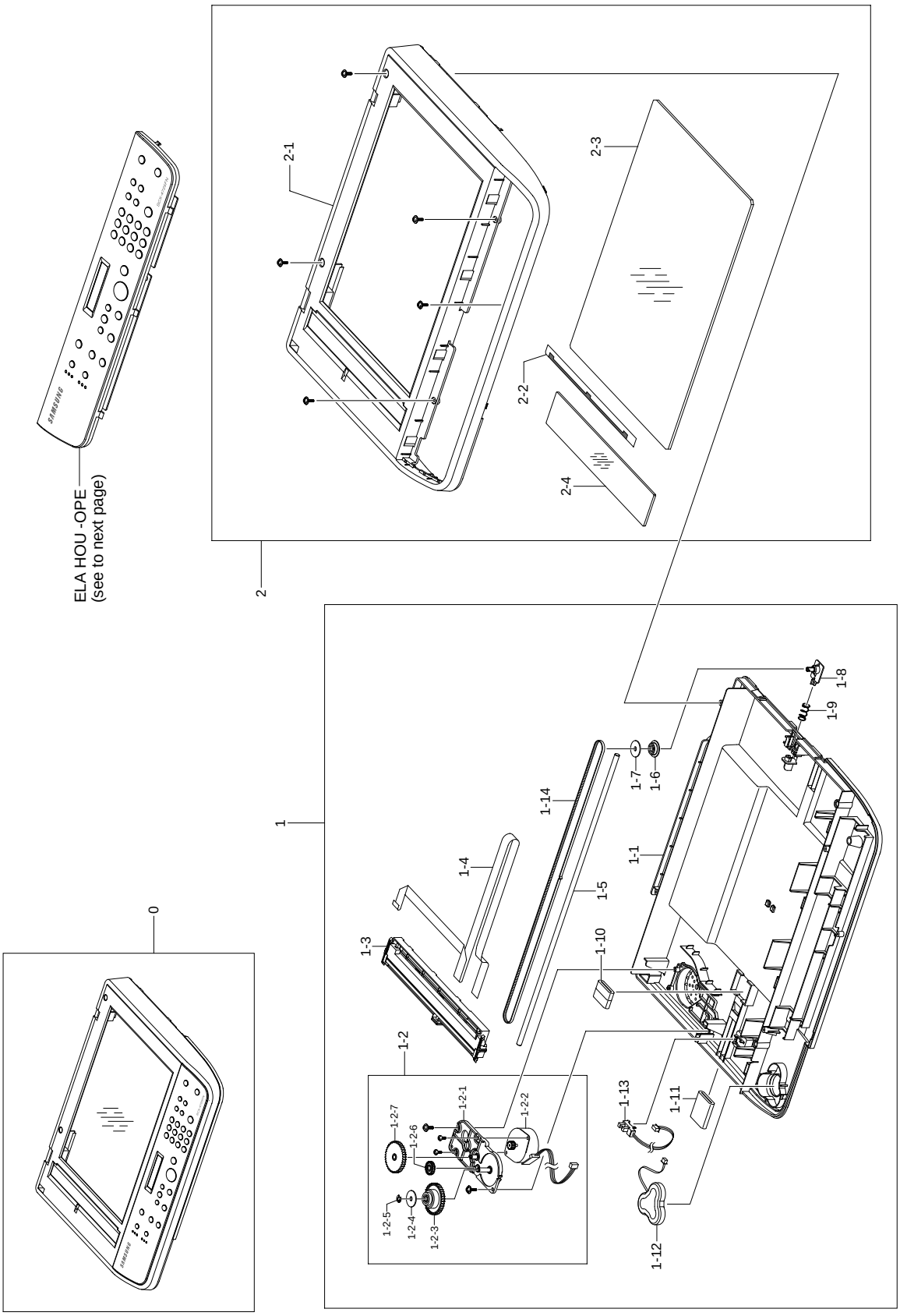
MEA-COVER PLATEN
(see to next page)

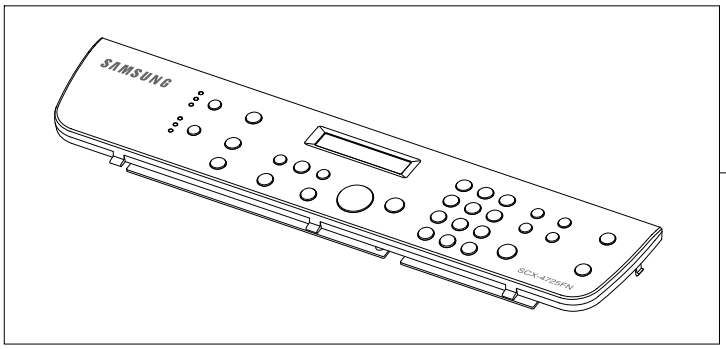
7.7 Platen Cover Ass'y

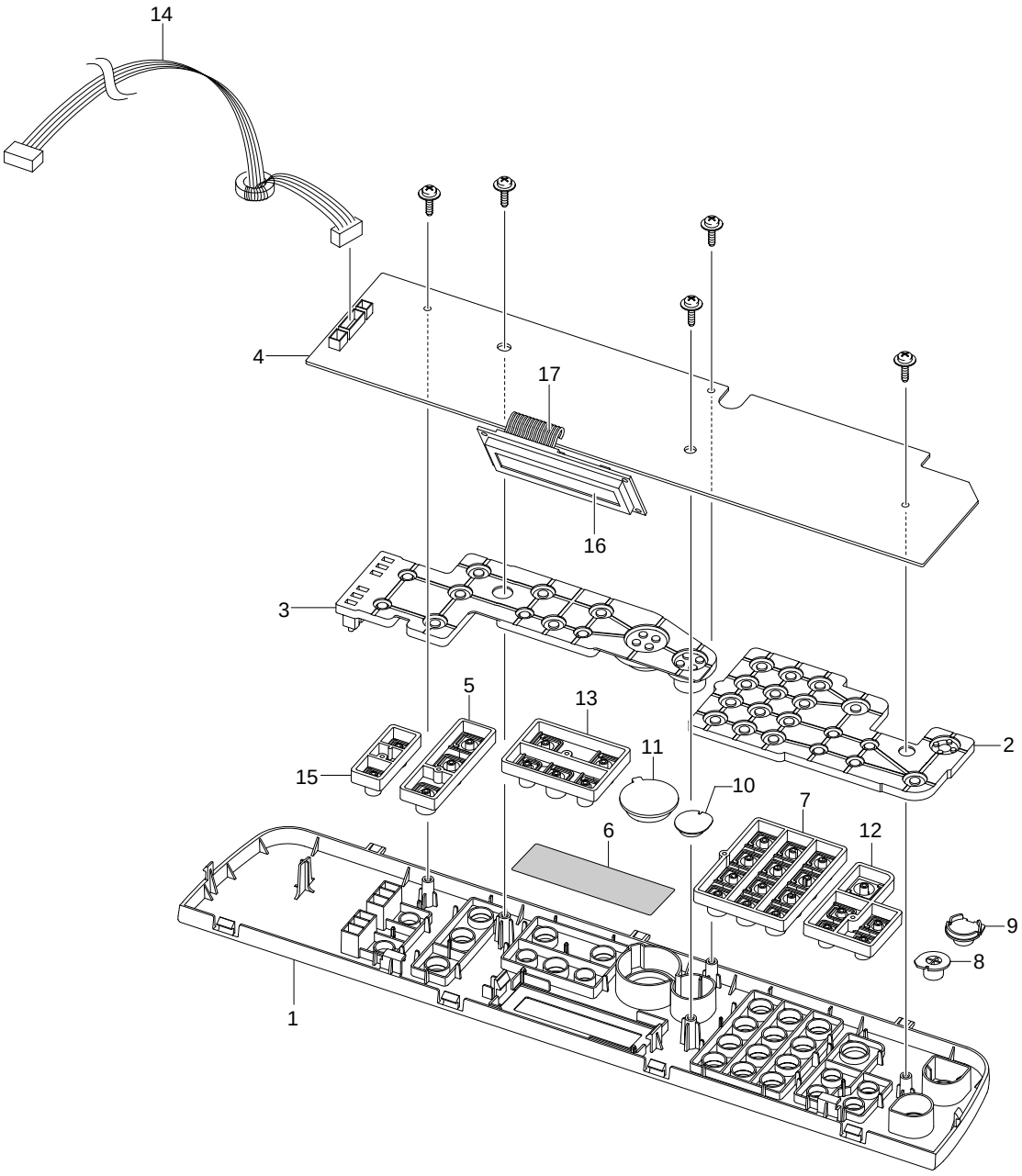


7.8 Platen Ass'y

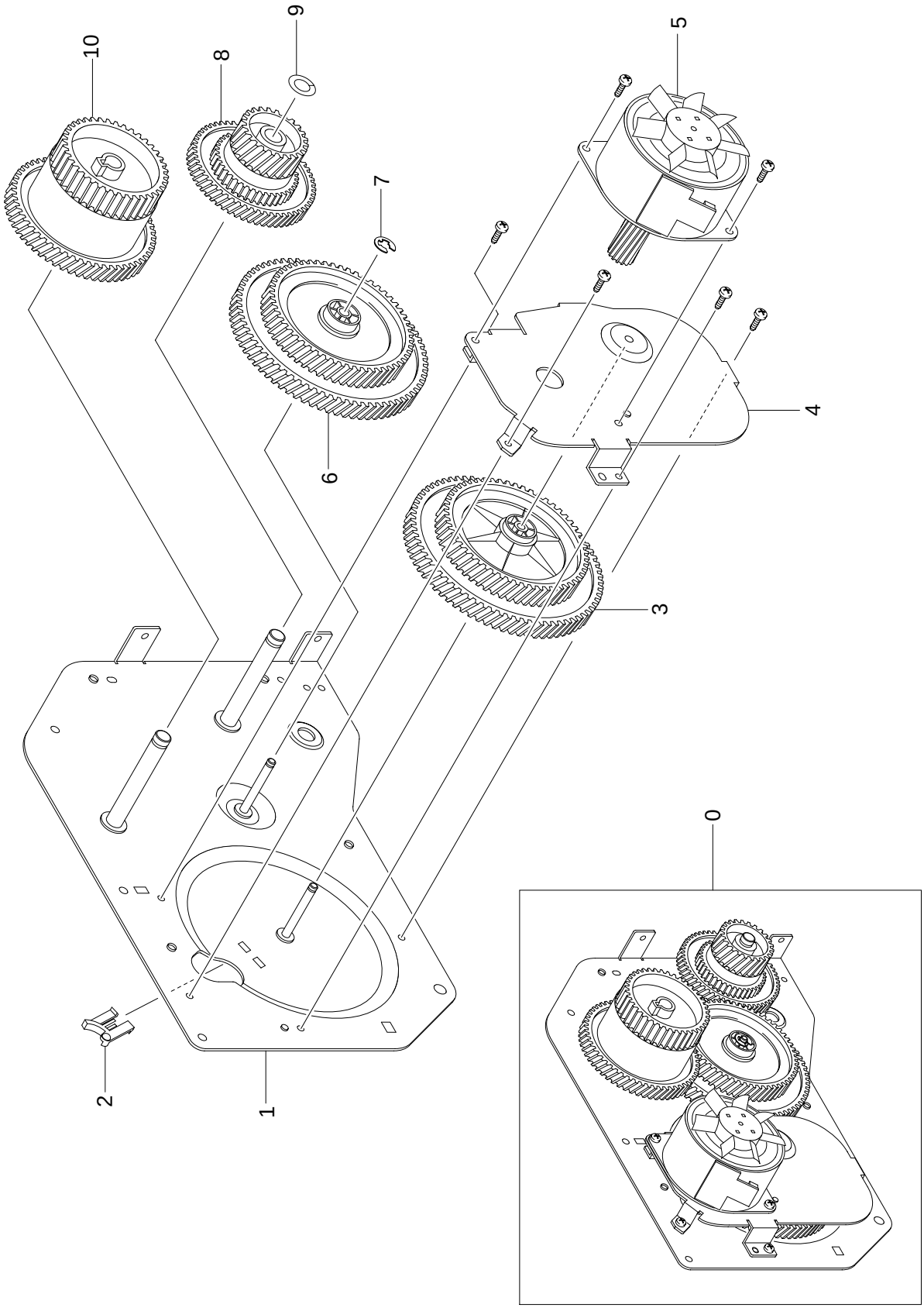


7.9 OPE Unit

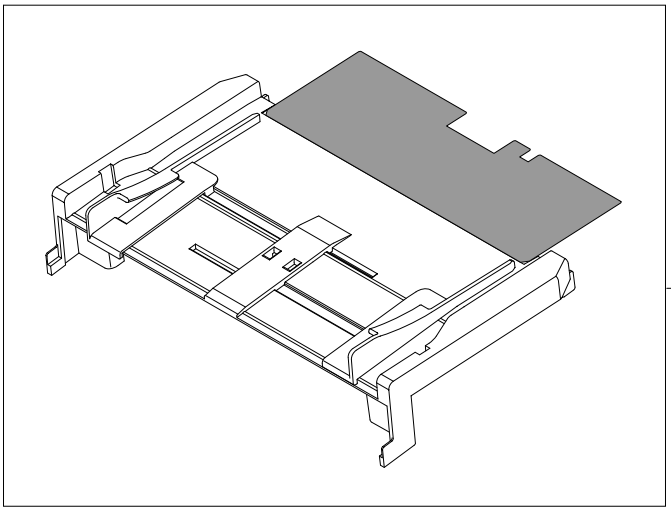


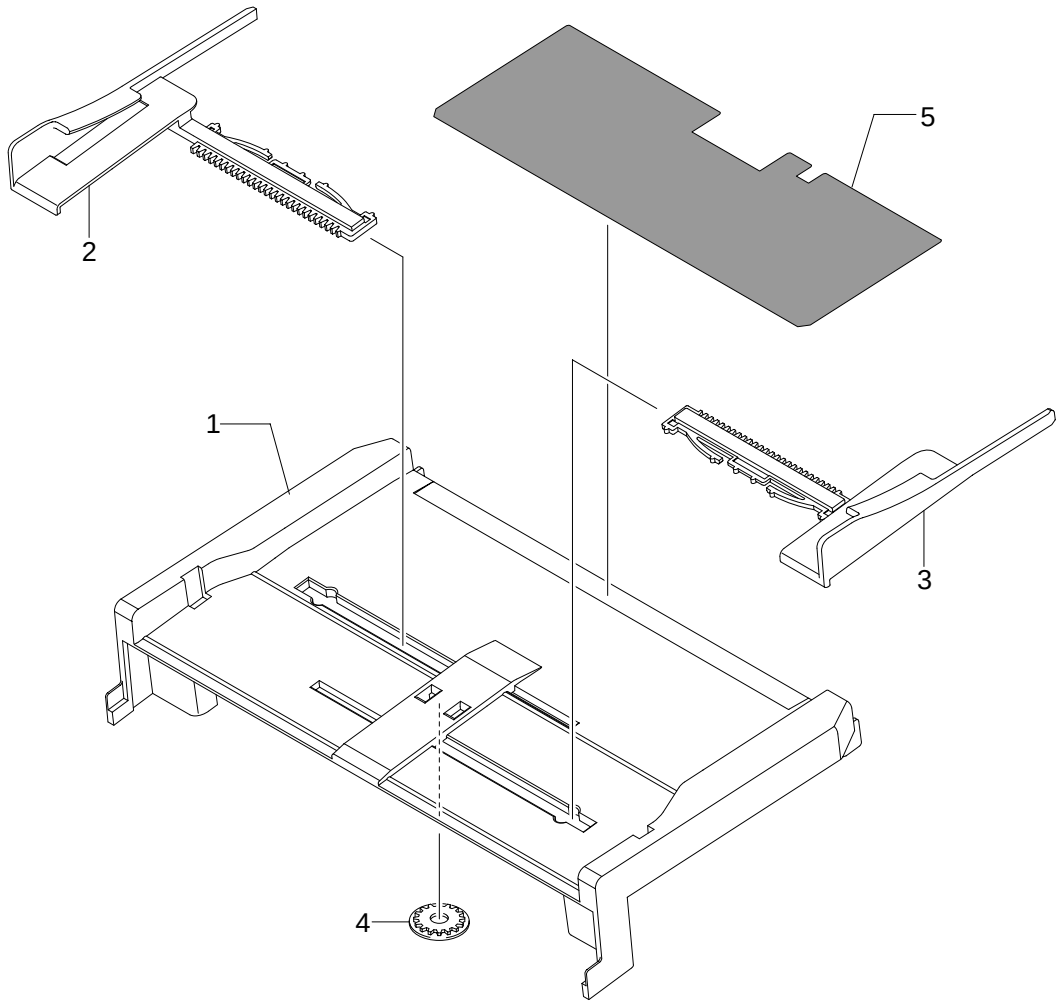


7.10 RX Drive Unit

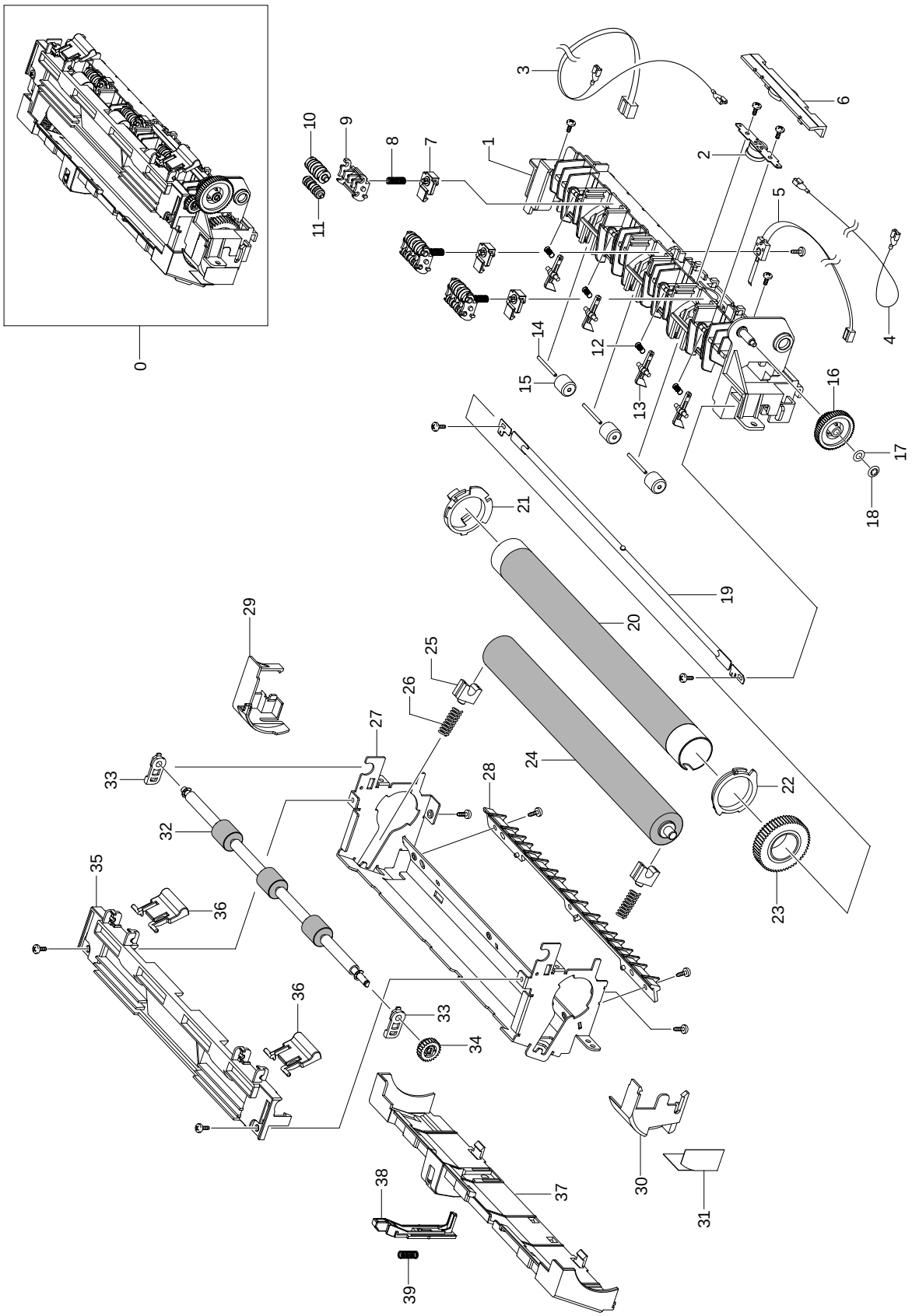


7.11 MP Tray

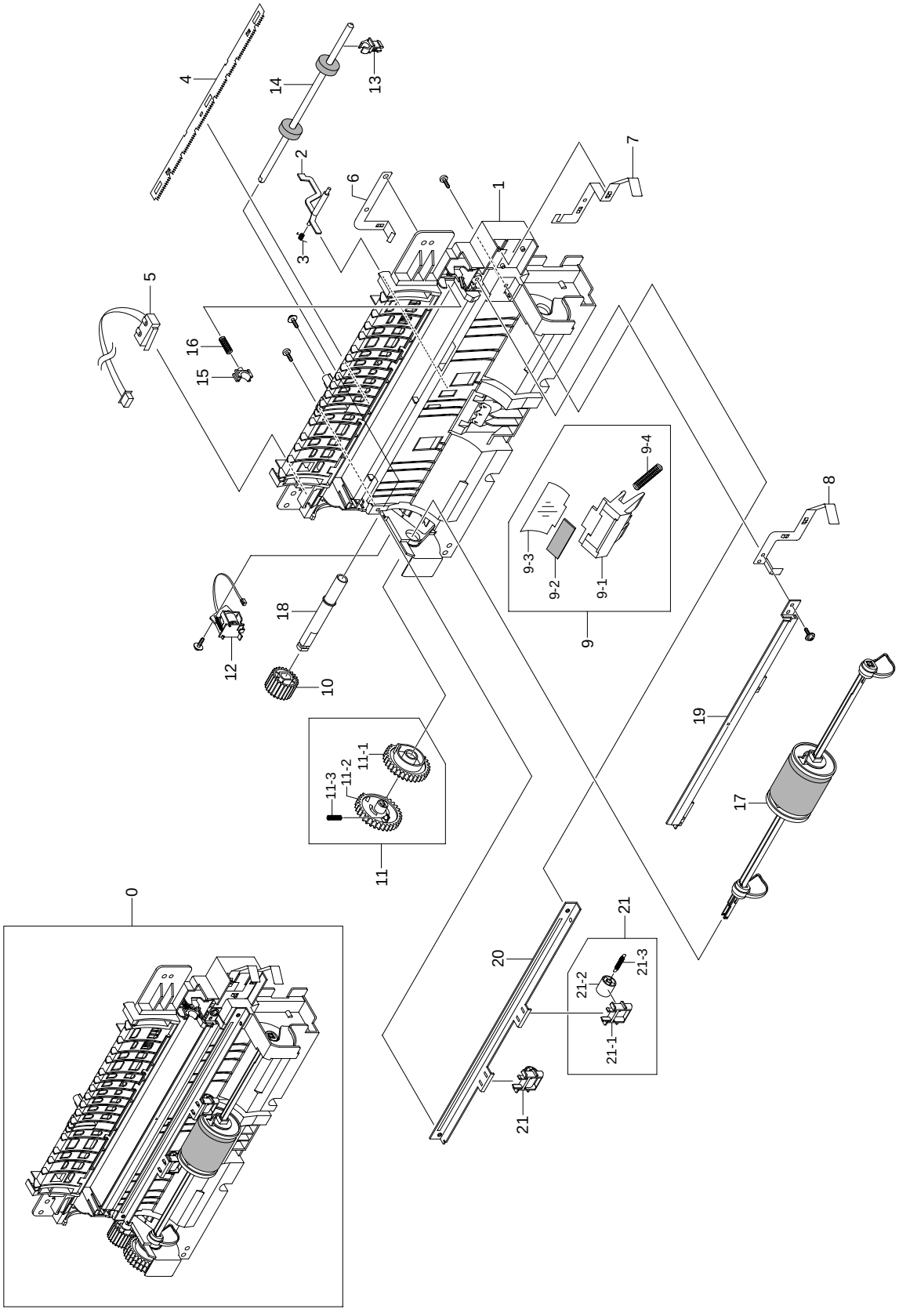




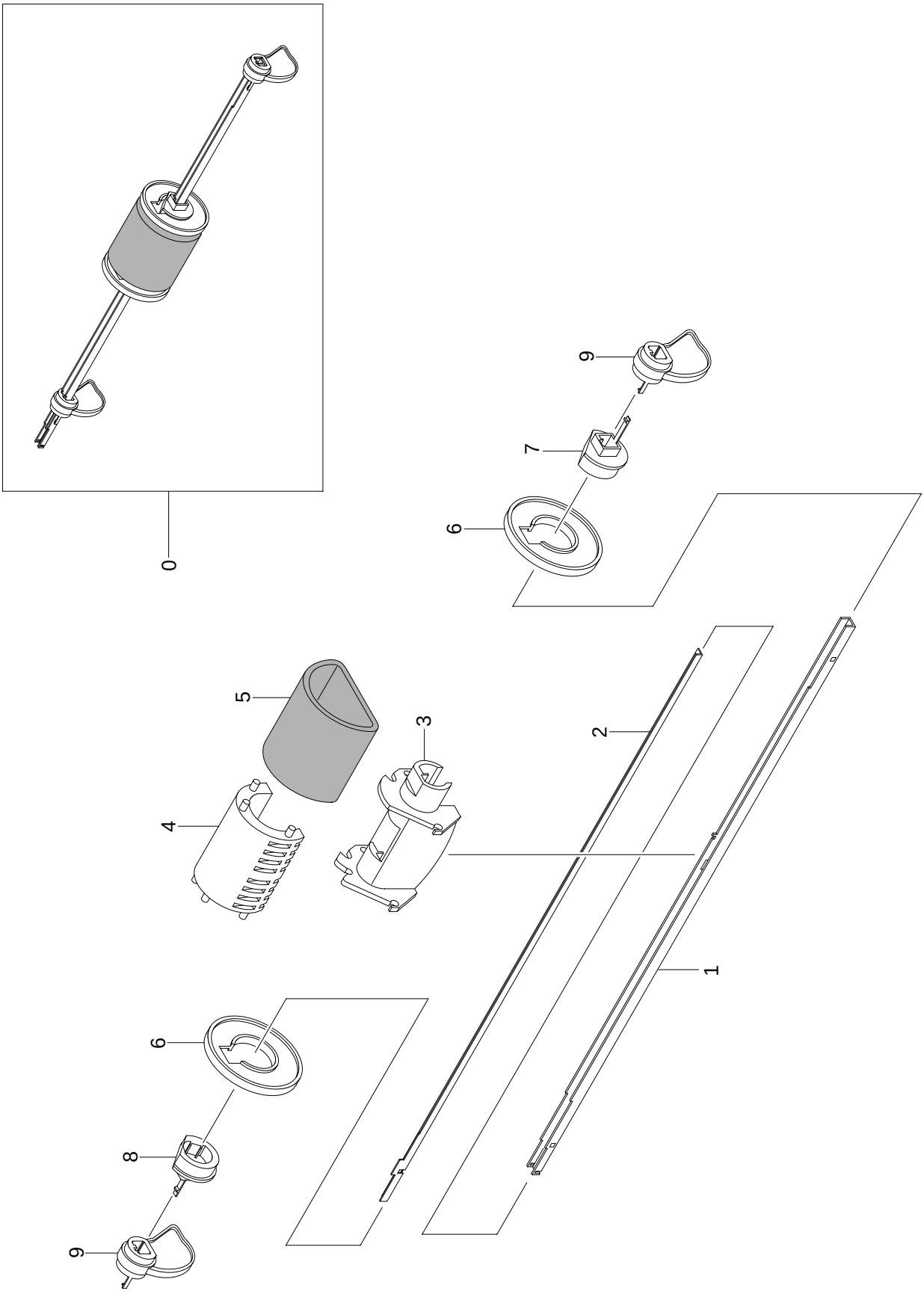
7.12 Fuser Unit



7.13 Paper Path Ass'y



7.14 Pick UP Unit



Service Parts List(Model: SCX-4725FN/XAZ)

Service(SA:service available,SNA:service not available)

Drawer#	SEC_Code	Description	QT'y	Service
7.1-0	SCX-4725FN/XAZ	SET		
7.1-1	JC96-04230A	ELA HOU-FRAME_LOWER	1	SA
7.1-2	JC96-04065A	ELA UNIT-LSU	1	SA
7.1-3	JC39-00642A	HARNESS-LSU	1	SA
7.1-4	JC96-03352V	ELA UNIT-DEVE INITIAL	1	SNA
7.1-5	JC96-04229A	ELA HOU-FUSER	1	SA
7.1-6	JC63-01190A	SHIELD-ENGINE	1	SNA
7.1-7	JC63-00631A	GROUND-P-HVPS	2	SNA
7.1-8	JC44-00133A	SMPS-V1	1	SA
7.1-9	JC92-01793B	PBA SUB-LIU	1	SA
7.1-10	JC39-00641A	HARNESS-LIU	1	SA
7.1-11	6103-000117	SUPPORTER	1	SNA
7.1-12	6502-000132	CABLE CLAMP	2	SA
7.1-13	6502-000132	CABLE CLAMP	1	SA
7.1-14	3103-001085	FAN-DC	1	SA
7.1-15	JC39-00228A	CBF HARNESS-GND	1	SNA
7.1-16	JC96-01672A	ELA UNIT-TERMINAL TR L	3	SA
7.1-16-1	JC70-40912A	ICT-SHAFT HV LARGE	1	SA
7.1-16-2	JC61-00031A	SPRING ETC--HV LARGE	1	SA
7.1-18	JC44-00132A	HVPS	1	SA
7.1-19	JC63-00722A	SHEET-HVPS	1	SA
7.1-20	JC63-01191A	SHIELD-PBA	1	SNA
7.1-21	JC92-01855A	PBA-MAIN	1	SA
7.1-23	JC39-00644A	HARNESS-SENSOR_JOINT	1	SA
7.1-24	JC96-04216A	ELA HOU-COVER	1	SNA
7.1-25	JC97-02239C	MEA UNIT-MP TRAY	1	SA
7.1-26	JC96-04237Q	ELA HOU-SCAN	1	SA
7.1-26-1	JC67-00087A	CAP-M-HINGE	2	SA
7.1-27	JC63-01204A	COVER-PAPER	1	SNA
7.1-28	3903-000020	CBF-POWER CORD	1	SA
7.1-29	JG61-40001A	FOOT-SF4000	1	SA
7.2-0	JC96-04216A	ELA HOU-COVER	1	SNA
7.2-1	JC97-02784A	MEA-COVER_FRONT	1	SA
7.2-2	JC96-04220A	ELA HOU-COVER SIDE L	1	SA
7.2-2-1	JC63-01176A	COVER-SIDE_L	1	SNA
7.2-2-2	3001-001494	SPEAKER	1	SA
7.2-2-3	GB70-10500A	IPR-UNIT FIXING BRAC	1	SA
7.2-2-4	JC72-01382A	SPONGE-COVER SIDE L	1	SNA
7.2-3	JC63-01177A	COVER-SIDE_R	1	SA
7.2-4	JC96-04219A	ELA HOU-COVER REAR	1	SA
7.2-5	JC97-02785A	MEA-COVER_MIDDLE	1	SA
7.2-5-1	JC63-01180A	COVER-MIDDLE	1	SNA
7.2-5-2	JC72-01351C	PMO-STACKER	1	SA
7.2-5-3	JC63-01250A	SHEET-FAN	1	SNA
7.3-0	JC97-02784A	MEA-COVER_FRONT	1	SA
7.3-1	JC63-01179A	COVER-FRONT	1	SNA
7.3-2	JC63-01188A	TRAY-CASSETTE_LOWER	1	SNA
7.3-3	JC63-00628D	TRAY-EXTENSION_L	1	SNA
7.3-4	JC63-01112A	TRAY-M_EXTENSION S	1	SNA

Service(SA:service available,SNA:service not available)

Drawer#	SEC_Code	Description	QT'y	Service
7.3-5	JC63-01203A	TRAY-CASSETTE_R	1	SNA
7.3-6	JC63-01189A	TRAY-CASSETTE _L	1	SNA
7.4-0	JC96-04219A	ELA HOU-COVER REAR	1	SA
7.4-1	JC63-01178A	COVER-REAR	1	SNA
7.4-2	JC63-01192A	COVER-JAM	1	SNA
7.4-3	JC92-01858A	PBA SUB-SENSOR	1	SA
7.4-4	JC67-00202A	CAP-JAM	1	SNA
7.4-5	JC63-01194A	COVER-FUSER_REAR	1	SNA
7.4-6	JC66-01304A	ACTUATOR-EXIT	1	SNA
7.4-7	JB61-00107A	SPRING ETC-LEVER SENSOR	1	SA
7.5-0	JC96-04230A	ELA HOU-FRAME_LOWER	1	SA
7.5-1	JC61-01703A	FRAME-M_BASE	1	SNA
7.5-2	JC97-02670A	MEA UNIT-KNOCK_UP	1	SA
7.5-2-1	JC61-01709A	PLATE-KNOCK_UP	1	SA
7.5-2-2	JC66-00720A	SHAFT-P-CORE	1	SA
7.5-2-3	JC74-00011A	MPR-PAD KNOCK UP MP	1	SA
7.5-3	6107-001163	SPRING-CS	2	SA
7.5-5	JC66-00808A	GEAR-FEED DR 41	1	SA
7.5-6	JC70-00527A	ADJUST-CASSETTE_L	1	SA
7.5-7	JC70-00528A	ADJUST-CASSETTE_R	1	SA
7.5-8	JG66-40003A	GEAR-PINION	1	SA
7.5-9	JC61-00836A	FOOT-FRONT	2	SA
7.5-10	JC61-01258A	SPRING ETC-TORSION DEVE_L	1	SA
7.5-11	JC61-01259A	SPRING ETC-TORSION DEVE_R	1	SA
7.5-12	JC31-00027A	FAN-DC_HUMMINGBIRD	1	SA
7.5-13	JC96-03797A	ELA HOU-CRUM	1	SNA
7.5-13-1	JC92-01763A	PBA SUB-CRUM_P	1	SA
7.5-14	JC63-00622A	GROUND-P-OPC	1	SA
7.5-15	JC66-01257A	ACTUATOR-EMPTY	1	SA
7.5-16	JB61-00076A	SPRING ETC-TORSION DOC (CC2-F)	1	SA
7.5-18	JC66-00813A	GEAR-TRANSFER	1	SA
7.5-19	JC66-01218A	ROLLER-TRANSFER	1	SA
7.5-20	JC39-00480A	CBF HARNESS-MAINMOTOR	1	SA
7.5-20	JC72-41142A	PMO-BUSHING TR	1	SNA
7.5-21	JC61-00047A	SPRING ETC-TR L HAWK	1	SA
7.5-22	JC72-41145D	PMO-TRANSFER HOLDER L	1	SNA
7.6-0	JC96-04232A	ELA HOU-ADF	1	SA
7.6-1	JC96-04233A	ELA HOU-ADF LOWER	1	SA
7.6-1-1	JC63-00656C	COVER-ADF LOWER	1	SNA
7.6-1-2	JC96-03379A	ELA HOU-ADF MOTOR	1	SA
7.6-1-2-1	JC66-00458A	GEAR-IDLE 35 ADF	3	SA
7.6-1-2-2	JC66-00322A	GEAR-CLUTCH 39	1	SA
7.6-1-2-3	JC66-00457A	GEAR-SWING 31/20 ADF	1	SA
7.6-1-2-4	JC66-00455A	GEAR-58/25 ADF	1	SA
7.6-1-2-5	JC66-00456A	GEAR-40/21 ADF	2	SA
7.6-1-2-6	JC61-01180A	BRACKET-P-MOTOR	1	SA
7.6-1-2-7	JC31-00036A	MOTOR STEP-ADF	1	SA
7.6-1-2-8	JC66-00556A	IMPELLER-ADF	1	SA
7.6-1-2-9	JC61-01178A	BRACKET-M-GEAR	1	SA
7.6-1-3	JC92-01845A	PBA SUB-ADF	1	SA
7.6-1-4	JC63-00667A	GROUND-P-ADF	1	SA
7.6-1-5	JC39-00407A	CBF HARNESS-ADF	1	SA
7.6-1-6	JC66-00560A	ROLLER-DRIVE	1	SA
7.6-1-7	JB72-00819A	PMO-BUSH	4	SA
7.6-1-8	JC66-00460A	SHAFT-M-FEED GEAR 38	1	SA
7.6-1-9	6044-000159	RING-C	1	SA

Service(SA:service available,SNA:service not available)

Drawer#	SEC_Code	Description	QT'y	Service
7.6-1-10	JC72-01011A	PMO-ACTUATOR SCAN SENSOR	1	SA
7.6-1-11	6107-001163	SPRING-CS	3	SA
7.6-1-12	JC75-00095A	MEC-BRUSH ANTISTATIC	1	SA
7.6-1-13	JB61-00076A	SPRING ETC-TORSION DOC (CC2-F)	3	SA
7.6-1-14	JC61-01179A	PLATE-M_WHITE BAR	1	SA
7.6-1-15	JC72-01009A	PMO-ACTUATOR DOC SENSOR	1	SA
7.6-1-16	JB66-00101A	GEAR-CLUTCH 29	1	SA
7.6-1-17	JC72-01010A	PMO-ACTUATOR REGI SENSOR	1	SA
7.6-1-18	JC66-00559A	ROLLER-EXIT	1	SA
7.6-2	JC97-02804A	MEA UNIT-ADF UPPER	1	SA
7.6-2-1	JC63-00657C	COVER-ADF UPPER	1	SNA
7.6-2-2	JC97-01709A	MEA UNIT-HOLDER ADF	1	SA
7.6-2-2-1	JC61-00694A	HOLDER-M-ADF	1	SA
7.6-2-2-2	JC63-00243A	SHEET-ADF HOLDER	1	SA
7.6-2-2-3	JB73-00052A	RMO-ADF RUBBER	1	SA
7.6-2-2-4	JC61-00387A	SPRING ETC-PAD	1	SA
7.6-2-3	JC61-00712A	GUIDE-STACKER SUB	2	SA
7.6-2-4	JC66-00594A	SHAFT-STACKER	2	SA
7.6-3	JC97-02801A	MEA UNIT-COVER OPEN	1	SA
7.6-3-1	JC63-00658C	COVER-ADF OPEN	1	SNA
7.6-3-2	JC97-02203A	MEA UNIT-PICKUP	1	SA
7.6-3-3	JB72-00819A	PMO-BUSH	1	SA
7.6-3-4	JB72-00843A	PMO-GUIDE PAPER	1	SA
7.7-0	JC97-02802A	MEA UNIT-COVER PLATEN	1	SA
7.7-1	JC63-00659C	COVER-PLATEN	1	SNA
7.7-2	JC63-00209A	SHEET-WHITE SPONGE	1	SA
7.7-3	JB72-01166D	PMO-TX STACKER	1	SA
7.7-4	JC61-00833C	GUIDE-DOC_R	1	SA
7.7-5	JC61-00834C	GUIDE-DOC_L	1	SA
7.7-6	JF70-10616A	IPR-WASHER SPRING CU	2	SA
7.7-7	JG66-40003A	GEAR-PINION	1	SA
7.7-8	JC61-00011A	SPRING ETC-FEED	6	SA
7.7-9	JF70-40521B	ICT-SHAFT PINCH	1	SA
7.7-10	JG72-40663A	PMO-ROLL PINCH	2	SA
7.7-11	JC66-00909A	SHAFT-IDLE FEED	2	SA
7.7-12	JC73-00091A	RPR-ROLLER EXIT IDLE	2	SA
7.7-13	JC97-02803A	MEA UNIT-TX STACKER	1	SA
7.8-0	JC96-04235A	ELA HOU-PLATEN	1	SA
7.8.1	JC96-04236A	ELA HOU-SCAN LOWER	1	SA
7.8-1-1	JC63-00660B	COVER-SCAN LOWER	1	SA
7.8-1-2	JC96-02655A	ELA HOU-SCAN MOTOR	1	SA
7.8-1-2-1	JC61-00698A	BRACKET-M-SCAN MOTOR	1	SA
7.8-1-2-2	JB31-00011A	MOTOR STEP-SCAN	1	SA
7.8-1-2-3	JB66-00082A	GEAR-TIMING	1	SA
7.8-1-2-4	JB72-01136A	PMO-HOLDER BELT	1	SA
7.8-1-2-5	6044-000125	RING-E	1	SA
7.8-1-2-6	JB66-00083A	GEAR-IDLE	1	SA
7.8-1-2-7	JB66-00084A	GEAR-REDUCTION	1	SA
7.8-1-3	0609-001223	CONTACT IMAGE SENSOR	1	SA
7.8-1-4	JC39-00408A	CBF SIGNAL-CIS FFC	1	SA
7.8-1-5	JC66-00838A	SHAFT-CIS	1	SA
7.8-1-6	JB72-01136A	PMO-HOLDER BELT	1	SA
7.8-1-7	JB72-01136A	PMO-HOLDER BELT	1	SA
7.8-1-8	JB72-00763A	PMO-PULLEY	1	SA
7.8-1-9	JB61-00109A	SPRING ETC-BELT	1	SA
7.8-1-11	JB96-01381A	ELA UNIT-CORE	2	SA

Service(SA:service available,SNA:service not available)

Drawer#	SEC_Code	Description	QT'y	Service
7.8-1-12	4302-001183	BATTERY-NIH(2ND)	1	SA
7.8-1-13	JC96-02417A	ELA HOU-FULL SENSOR HARNESS	1	SA
7.8-1-14	6602-001067	BELT-TIMING GEAR	1	SA
7.8-2	JC97-02805A	MEA UNIT-SCAN UPPER	1	SA
7.8-2-1	JC63-00661C	COVER-SCAN UPPER	1	SA
7.8-2-2	JB68-00644A	LABEL(P)-SHADING	1	SA
7.8-2-3	JB01-00002A	GLASS-PLATEN	1	SA
7.8-2-4	JB01-00001A	GLASS-ADF	1	SA
7.9-0	JC96-04234Q	ELA HOU-OPE	1	SA
7.9-1	JC63-01213Q	COVER-OPE	1	SNA
7.9-2	JC73-00202A	RUBBER-TEL	1	SA
7.9-3	JC73-00203A	RUBBER-SCROLL	1	SA
7.9-4	JC92-01727A	PBA SUB-WHITNEY_OPE	1	SA
7.9-5	JC64-00054F	KEY-COPY	1	SA
7.9-6	JC63-00076A	COVER-WINDOW SF-530	1	SA
7.9-7	JC64-00053G	KEY-TEL	1	SA
7.9-8	JC64-00157D	KEY-SCAN TO	1	SA
7.9-9	JC64-00058A	KEY-M-TONER SAVE	1	SA
7.9-10	JC64-00187A	KEY-M-STOP	1	SA
7.9-11	JC64-00114A	KEY-M_START	1	SA
7.9-12	JC64-00060F	KEY-FAX	1	SA
7.9-13	JC64-00056G	KEY-SCROLL	1	SA
7.9-14	JC39-00412A	CBF HARNESS-OPE	1	SA
7.9-15	JC64-00059E	KEY-RESOLUTION	1	SA
7.9-16	JC72-00672A	PCT-LCD WINDOW	1	SNA
7.10-0	JC96-04033A	ELA UNIT-RX DRIVE	1	SA
7.10-1	JC61-01727A	BRACKET-P_GEAR	1	SNA
7.10-2	JC60-00023A	SPACER-GEAR	1	SA
7.10-3	JC66-00804A	GEAR-RDCN 139/83	1	SA
7.10-4	JC61-01708A	BRACKET-P_MOTOR	1	SNA
7.10-5	JC31-00068A	MOTOR STEP	1	SA
7.10-6	JC66-00805A	GEAR-RDCN 113/83	1	SA
7.10-7	6044-000159	RING-C	1	SA
7.10-8	JC66-00806A	GEAR-OPC DR 76/38/29	1	SA
7.10-9	6031-000023	WASHER-PLAIN	1	SA
7.10-10	JC66-01244A	GEAR-FUSER DRIVER	1	SA
7.10-11	JC72-00825A	PMO-IMPELLER_DRV	1	SA
7.11-0	JC97-02239C	MEA UNIT-MP TRAY	1	SA
7.11-1	JC61-01263C	PLATE-MP	1	SA
7.11-2	JC70-00514C	ADJUST-MP L	1	SA
7.11-3	JC70-00515C	ADJUST-MP R	1	SA
7.11-4	JG66-40003A	GEAR-PINION	1	SA
7.11-5	JC63-00711A	SHEET-MP	1	SA
7.12-0	JC96-04229A	ELA HOU-FUSER	1	SA
7.12-1	JC63-01126A	COVER-FUSER	1	SNA
7.12-2	4712-001032	THERMOSTAT	1	SA
7.12-3	JC39-00403A	CBF HARNESS-FUSER(110V)	1	SA
7-12-4	JC39-00404A	CBF HARNESS-FUSER JOINT	1	SA
7.12-5	1404-001373	THERMISTOR-NTC ASSY	1	SA
7.12-6	JC67-00085A	CAP-M-THERMO	1	SNA
7.12-7	JC61-01747A	HOLDER-SPRING	3	SA
7.12-8	6107-001163	SPRING-CS	3	SA
7.12-9	JC61-01172A	HOLDER-M-EXIT F/DOWN	3	SNA
7.12-10	JC66-01311A	ROLLER-EXIT_MAIN	3	SNA
7.12-11	JC66-00934A	ROLLER-M_EXIT FR	3	SNA
7.12-12	6107-001291	SPRING-ES	4	SNA

Service(SA:service available,SNA:service not available)

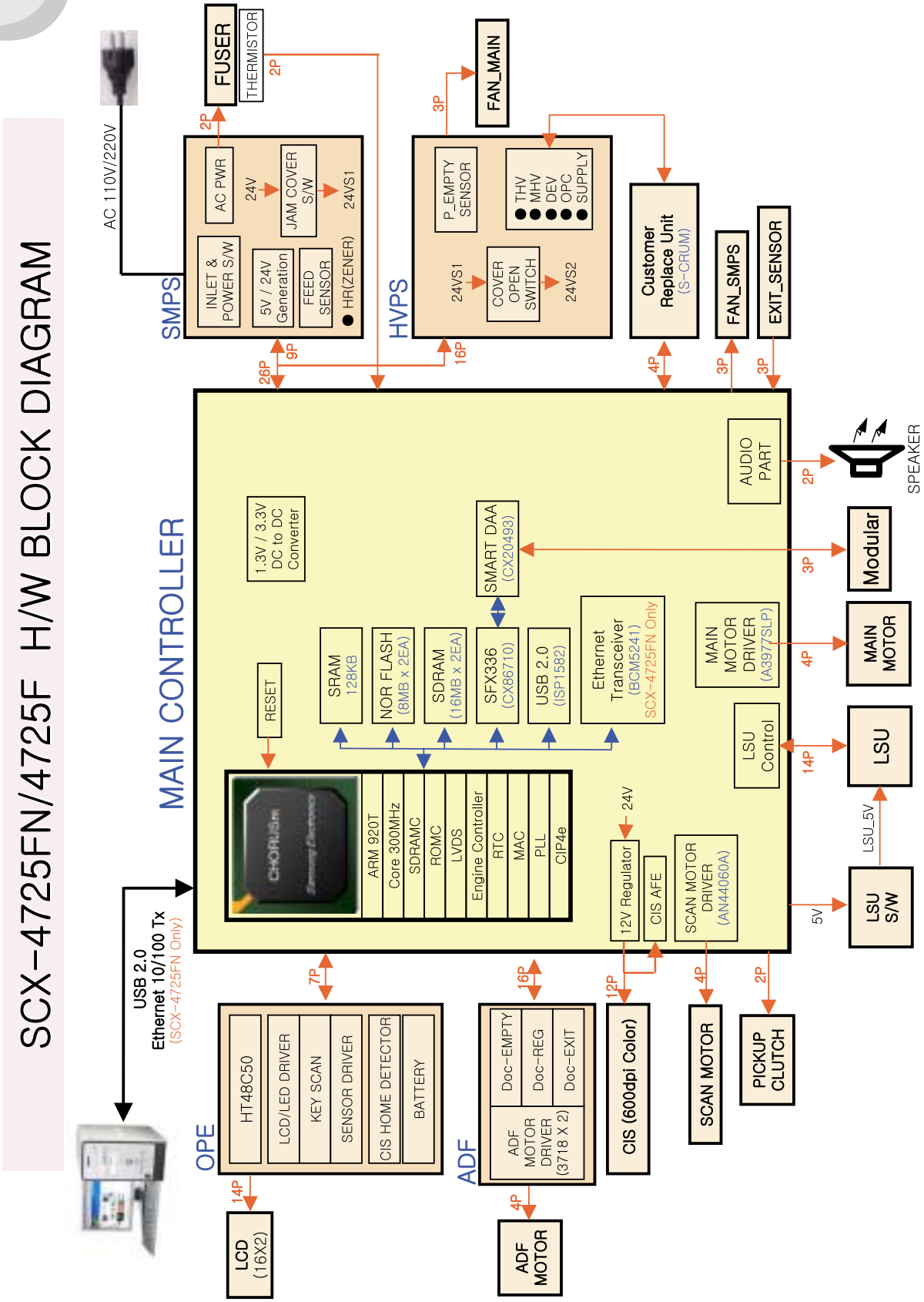
Drawer#	SEC_Code	Description	QT'y	Service
7.12-13	JC61-01721A	GUIDE-CLAW	4	SNA
7.12-14	JC70-00064A	IPR-PIN ROLLER EXIT	3	SNA
7.12-15	JC72-20902A	PEX-ROLLER F/UP(2)	3	SA
7.12-16	JC66-00801A	GEAR-EXIT_DR38/25	1	SNA
7.12-17	6031-000023	WASHER-PLAIN	1	SNA
7.12-18	6044-000001	RING-CS	1	SNA
7.12-19	4713-001211	LAMP-HALOGEN	1	SA
7.12-20	JC66-01256A	ROLLER-HEAT	1	SA
7.12-21	JC61-00887A	BUSH-M-HR R_R2	1	SA
7.12-22	JC61-00888A	BUSH-M-HR L_R2	1	SA
7.12-23	JC66-01254A	GEAR-FUSER	1	SA
7.12-24	JC66-00600A	ROLLER-PRESSURE	1	SA
7.12-25	JC66-10901B	BUSH-PRESSURE_ROLLER	2	SNA
7.12-26	JC61-00056A	SPRING ETC-PR(7300)	2	SA
7.12-27	JC61-01770A	FRAME-FUSER	1	SNA
7.12-28	JC61-00595A	GUIDE-M-INPUT	1	SNA
7.12-29	JC63-01129A	COVER-LAMP_R	1	SNA
7.12-30	JC63-01130A	COVER-LAMP_L	1	SNA
7.12-31	JC63-01245A	SHEET-FUSER	1	SNA
7.12-32	JC66-01255A	ROLLER-EXIT F/DOWN	1	SA
7.12-33	JC61-01719A	HOLDER-EXIT R	2	SA
7.12-34	JC66-00810A	GEAR-EXIT_DRV17	1	SA
7.12-35	JC63-01193A	COVER-FUSER_FRONT	1	SNA
7.12-36	JC72-01001A	PMO-SUB STACKER	2	SA
7.12-37	JC63-01195A	COVER-FUSER_SAFETY	1	SNA
7.12-38	JC66-01303A	ACTUATOR-JAM	1	SNA
7.12-39	JC61-00049A	SPRING ETC-TR(KOR)	1	SNA
7.12-40	JC60-00024A	SPACER-FUSER	2	SA
7.13-0	JC97-02664A	MEA UNIT-PAPER PATH	1	SA
7.13-1	JC61-01710A	GUIDE-PAPER PATH	1	SA
7.13-2	JC66-01250A	ACTUATOR-FEED SENSOR	1	SA
7.13-3	JB61-00107A	SPRING ETC-LEVER SENSOR	1	SA
7.13-4	JC70-10232A	IPR-PLATE SAW	1	SA
7.13-5	JC39-00482A	CBF HARNESS-MICRO SW	1	SA
7.13-6	JC63-01125A	GROUND-P_SAW	1	SNA
7.13-7	JC63-00623A	GROUND-P-THV	1	SNA
7.13-8	JC63-00625A	GROUND-P-VARISTOR	1	SNA
7.13-9	JC97-02669A	MEA UNIT-HOLDER_PAD	1	SA
7.13-9-1	JC61-01711A	HOLDER-PAD	1	SA
7.13-9-2	JC69-00987A	PAD-FRICTION	1	SA
7.13-9-3	JC63-00290A	SHEET-HOLDER PAD	1	SA
7.13-9-4	JC61-70911A	SPRING ETC-EXIT ROLL FD	1	SA
7.13-10	JC66-01247A	GEAR-FEED	1	SA
7.13-11	JC97-02665A	MEA UNIT-PICK UP GEAR	1	SA
7.13-11-1	JC66-01245A	GEAR-PICK UP A	1	SA
7.13-11-2	JC66-01246A	GEAR-PICK UP B	1	SA
7.13-11-3	6107-001163	SPRING-CS	1	SA
7.13-12	JC33-00015B	SOLENOID-MP_R2	1	SA
7.13-13	JC72-00382B	PMO-BUSHING FEED	1	SA
7.13-14	JC66-01251A	ROLLER-FEED	1	SA
7.13-15	JC72-00102A	PMO-BUSHING_TR(L)	1	SA
7.13-16	JC61-70940A	SPRING ETC-TR(12)	1	SA
7.13-18	JC66-01252A	SHAFT-FEED	1	SA
7.13-19	JC70-00307A	IPR-P-EARTH TRANSFER	1	SA
7.13-24	JC61-01715A	PLATE-P_IDLE HOLDER	1	SA
7.13-25-1	JC61-01718A	HOLDER-IDLE ROLLER	2	SA

Service(SA:service available,SNA:service not available)

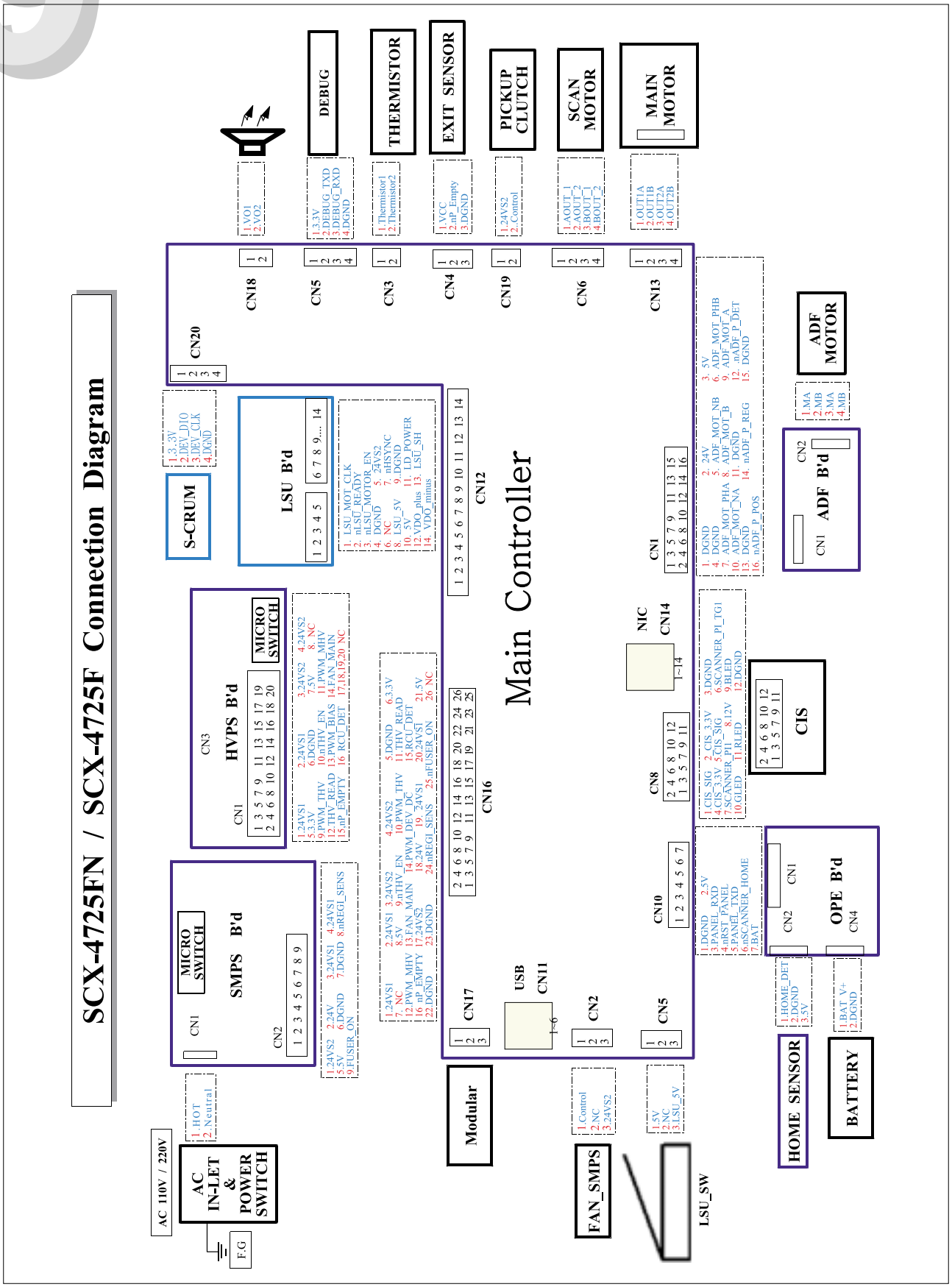
Drawer#	SEC_Code	Description	QT'y	Service
7.13-25-2	JC66-00529A	ROLLER-M-IDLE FEED	2	SA
7.13-25-3	6107-001291	SPRING-ES	2	SA
7.14-0	JB75-00300A	MEC-PICK UP ROLLER ASSY	1	SA
7.14-1	JC66-00829A	SHAFT-P-PICK_UP	1	SA
7.14-2	JC61-01281A	BRACKET-P-BAR_PICK_UP	1	SNA
7.14-3	JC61-01717A	HOUSING-PICK UP B	1	SA
7.14-4	JC61-01716A	HOUSING-PICK UP A	1	SA
7.14-5	JC73-00239A	RUBBER-PICK_UP	1	SA
7.14-6	JC66-01253A	ROLLER-PICK_UP IDLE	2	SA
7.14-7	JC61-01713A	STOPPER-PICK_UP R	1	SA
7.14-8	JC61-01714A	STOPPER-PICK_UP L	1	SA
7.14-9	JC66-01258A	CAM-PICK_UP	2	SA
Replacement	JC69-01026A	BOX-MAIN	1	SA
Replacement	JF39-50094B	CBF LINE CORD	1	SA

8. Block Diagram

8.1 System Block Diagram



9. Connection Diagram



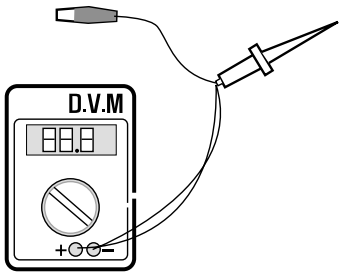
10. Reference Information

This chapter describes the reference information for applying this training manual, and it is consist-ed of the tool list, the abbreviation table, the outline of model, and so on.

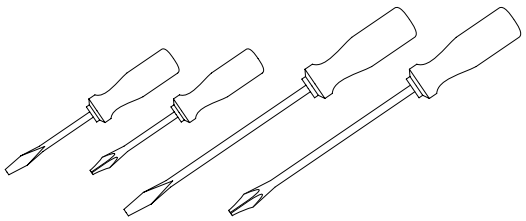
10.1 Troubleshooting Tool

The following tools are recommended safe and easy troubleshooting as described in this service manual.

- **DVM(Digital Volt Meter)**
  Standard : Indicates more than 3 digits.



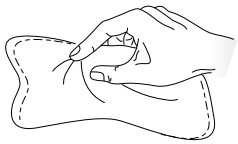
- **Driver**
  Standard : "-" type, "+" type (M3 long, M3 short, M2 long, M2 short).



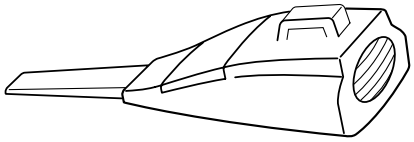
- **Tweezers**
  Standard : For general home use, small type.

- **Cotton Swab**
  Standard : For general home use, for medical service.

- **Cleaning Equipments**
  Standard : An IPA(Isopropyl Alcohol)dry wipe tissue or a gentle neutral detergent and lint-free cloth.

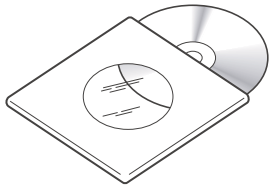


- **Vacuum Cleaner**



- **Spring Hook**
  Standard : For general use

- **Software (Driver) installation CD ROM**



10.2 Acronyms and Abbreviations(1)

The table below explains the abbreviations and acronyms used in this service manual. Where abbreviations or acronyms are used in the text please refer to this table.

Abbreviations	Explanation
AP	Access Point
AC	Alternating Current
APC	Auto Power Control
ASIC	Application Specific Integrated Circuit
ASSY	assembly
BIOS	Basic Input Output System
BLDC	Brush-less Direct Current
CMOS	Complementary Metal Oxide Semiconductor
CN	connector
CON	connector
CPU	Central Processing Unit
dB	decibel
dbA	decibel A
dBM	decibel milliwatt
DC	direct current
DCU	Diagnostic Control Unit
DPI	Dot Per Inch
DRAM	Dynamic Random Access Memory
DVM	Digital Voltmeter
ECP	Enhanced Capability Port
EDC	Embedded Diagnostic control
EEPROM	Electronically Erasable Programmable Read Only Memory
EMI	Electro Magnetic Interference
EP	electrophotographic
EPP	Enhanced Parallel Port
FPOT	First Printout Time
F/W	firmware
GDI	graphics device interface
GND	ground
HBP	Host Based Printing
HDD	Hard Disk Drive
H/H	High temperature and high marshy place
HV	high voltage
HVPS	High Voltage Power Supply
I/F	interface
I/O	Input and Output
IC	integrated circuit
IDE	Intelligent Drive electronics or Imbedded Drive Electronics

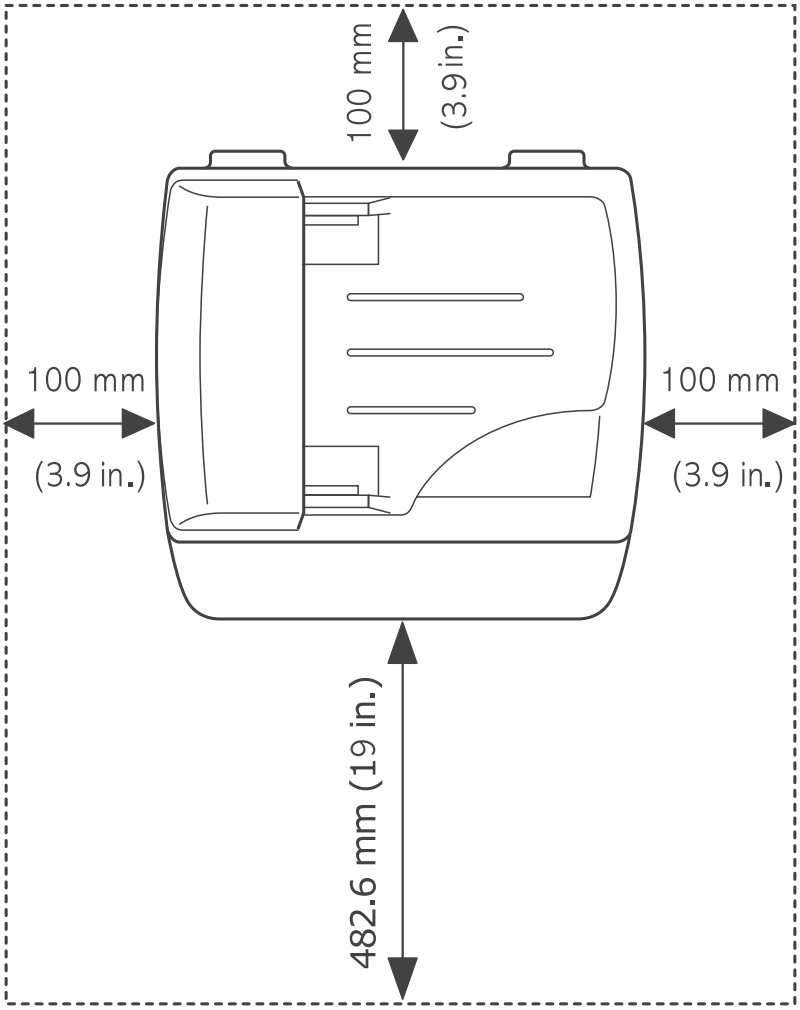
Acronyms and Abbreviations(2)

Abbreviations	Explanation
IEEE	Institute of Electrical and Electronics Engineers. Inc
IPA	Isopropy Alcohol
IPM	Images Per Minute
LAN	local area network
lb	pound(s)
LBP	Laser Beam Printer
LCD	Liquid Crystal Display
LED	Light Emitting Diode
L/L	Low temperature and low marshy place
LSU	Laser Scanning Unit
MB	megabyte
MHz	megahertz
MPF	Multi Purpose Feeder
NIC	Network Interface Card
N/N	Normal temperature and normal marshy place
NVRAM	nonvolatile random access memory
OPC	Organic Photo Conductor
OPE	Operate Panel Equipment
PBA	Printed Board Assembly
PCL	Printer Command Language , Printer Control Language
PDL	Page Discription Language
PPM	Page Per Minute
PPS	Pulse Per Second
PS	Post Script
PTL	Pre-Transfer Lamp
PWM	Pulse Width Modulation
Q-PID	Quick Printer Initiating Device
Q'ty	quantity
RAM	Random Access Memory
ROM	Read Only Memory
SCF	Second Cassette Feeder
SMPS	Switching Mode Power Supply
SPGP	Samsung Printer Graphic Processor
SPL	Samsung Printer Language
Spool	Simultaneous Peripheral Operation Online
SW	switch
sync	synchronous or synchronization
USB	Universal Serial Bus
WECA	Wireless Ethernet Compatibility Alliance

10.3 Selecting printer locations

- Leave enough room to open the printer trays, covers, and allow for proper ventilation. (see diagram below)

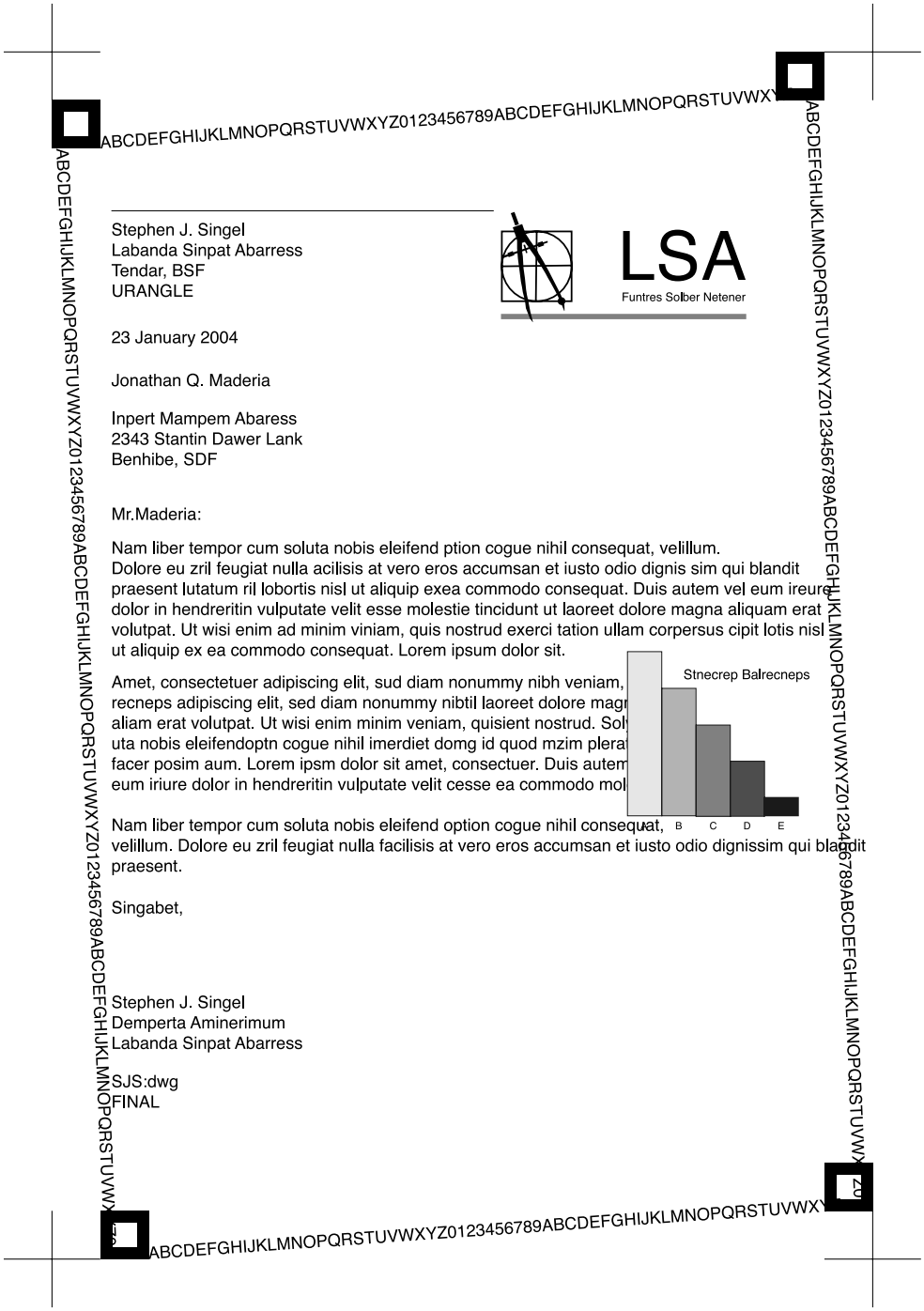
- Provide the proper environment :
  - A firm, level surface
  - Away from the direct airflow of air conditioners, heaters, or ventilators
  - Free of extreme fluctuations of temperature, sunlight, or humidity
  - Clean, dry, and free of dust



10.4 Sample Tests Patterns

The sample patterns shown below are the standard test patterns used in the factory.
The life of the toner cartridge, developer cartridge and printing speed are measured with the pattern shown below. The A4 ISO 19752 standard pattern samples are reproduced reduced to 70% of the actual A4 size.

A4 ISO 19752 Standard Patterns


ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
Stephen J. Singel
Labanda Sinpat Abarress
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23 January 2004
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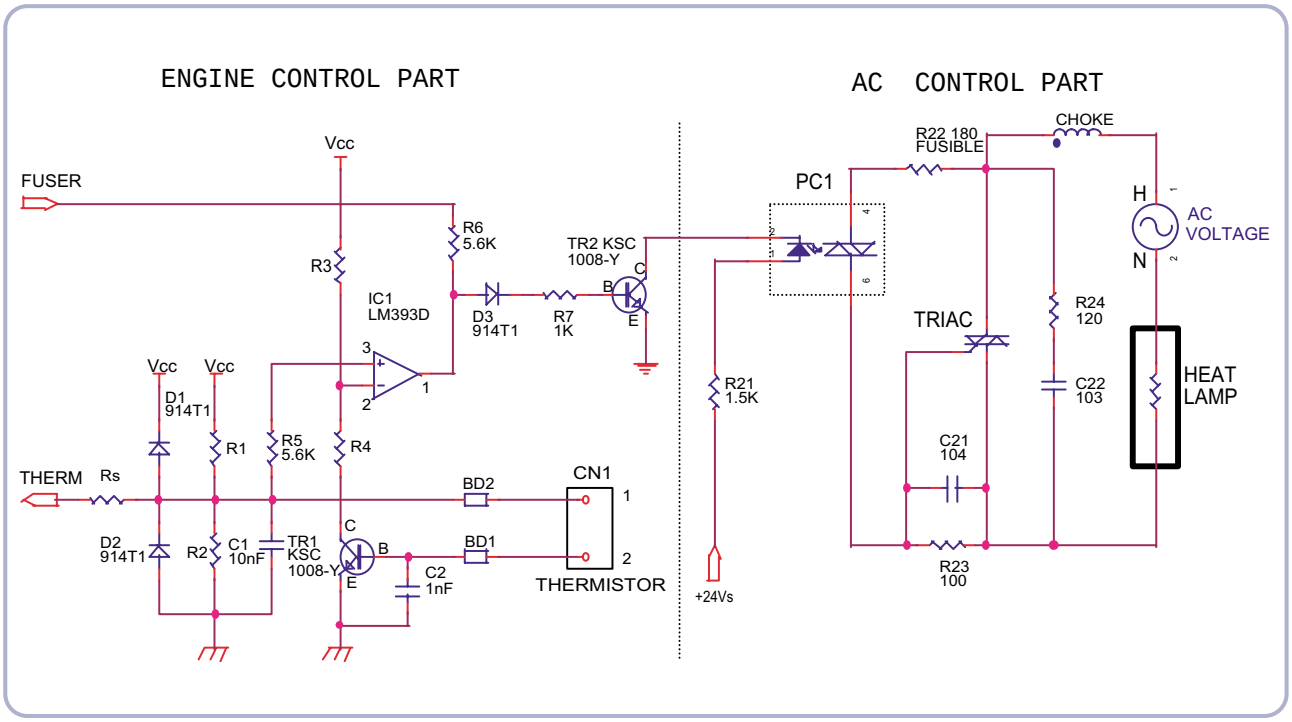
11. Circuit Description

11.1 Engine Controller

The engine controller module consists of a motor controller, a PWM controller, a LSU I/F controller, and an ADC I/F controller.

11.1.1 Heater Control



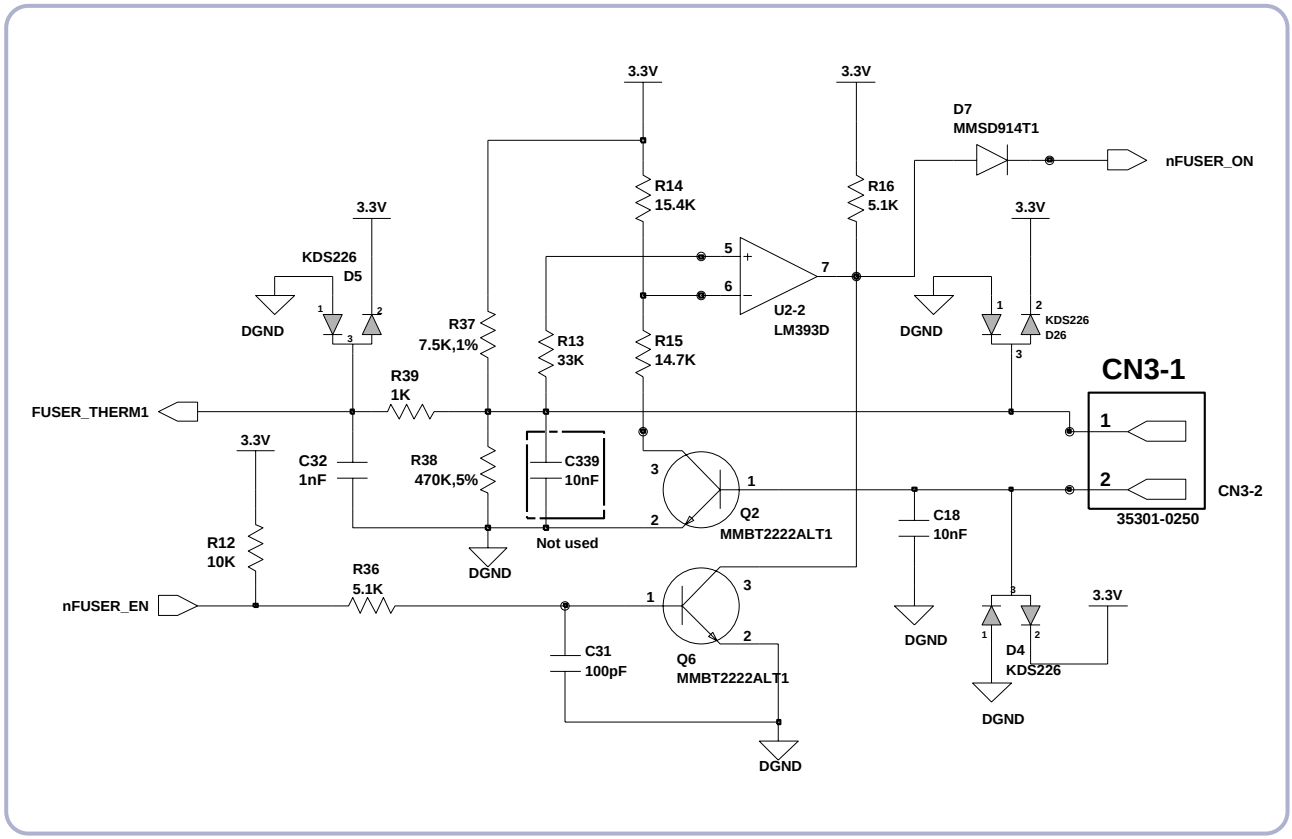
The heat lamp radiates heat by using AC power. The AC power is a TRIAC (a semiconductor switch device) which controls a switch. The 'ON/OFF' control is completed by turning on/off a gate of the TRIAC through a photo TRIAC which is insulation part.

If explaining more detail about the AC control part, it consists of passive circuit ; therefore, it turns on/off the heater by receiving the signal from the engine control part. If the heater on signal is turned on at the engine, electricity flows in as the LED of the PC1 (Photo TRIAC) is connected. Then, it emits light.

By this light, the TRIAC unit, a light receiving unit, becomes on, and electricity is supplied to the gate of the TRIAC. Then, the TRIAC is turned on. As a result, AC current flows in a heat lamp, and the heat lamp radiates heat.

On the other contrary, if the signal is turned off, the PC1 becomes off, and the TRIAC is turned off due to no electricity at the gate of the TRIAC. Consequently, the heat lamp is turned off.

- Special Feature of TRIAC (THY 1): 16A, 600V SWITCHING
- Phototriac Coupler (PC3)
  - Turn On If Current: 15mA~50mA (Design: 16mA)
  - High Repeive Peak Off State Voltage: Min 600V



■ Explanation about the condition of Normal Operation

- If the fuser (P3.7) port becomes high, the Q6 is activated. A heat lamp starts operating by the activity. As the temperature of the heat lamp is increased, the resistance value of the thermister is decreased. Therefore, the electric potential of the circled A becomes low.
- On/Off operation of the Q6 is only controlled by the fuser (P3.7) port because 5(+) of the U11(Comparator) is always higher than 6 (-) within the normal control temperature rage.

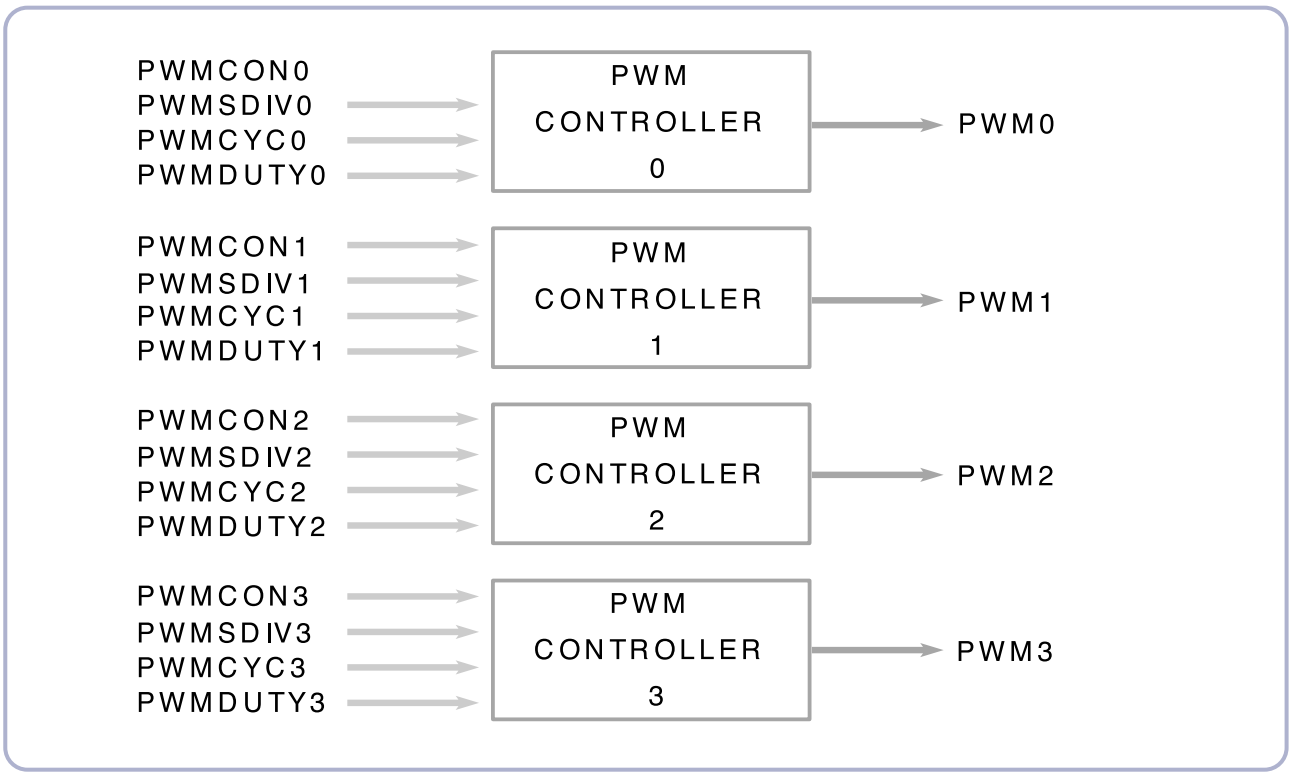
■ Functions of the Malfunction Protection:

- If the fuser port (P3.7) is turned on regardless of controlling due to system malfunction, the temperature of the heat roller goes abnormally high. At this time, the resistance value of the thermister becomes low.
- When the resistance value of the thermister becomes low, the electric potential of the circled A gets low, and when the temperature goes over the certain temperature, the comparator (U11) gets a low output. As a result, even though the fuser port is abnormally activated, it is disable to be over the regular temperature. For maintaining a regular temperature, a protect circuit consists in it (This protection is set up to start operating at the rage between 205°~210°)

11.1.2 PWM Controller

■ Function Description

PWM TIMER consists of each sub block which has various functions. The sub block is divided based on this block diagram. The entire diagram of the PWMTIMER is organized as below.



PWM TIMER OPERATION is figured out if calculating PHCLK by the value selected by the register setting and the divider. PHCLK is created by count block at the PWM TIMER

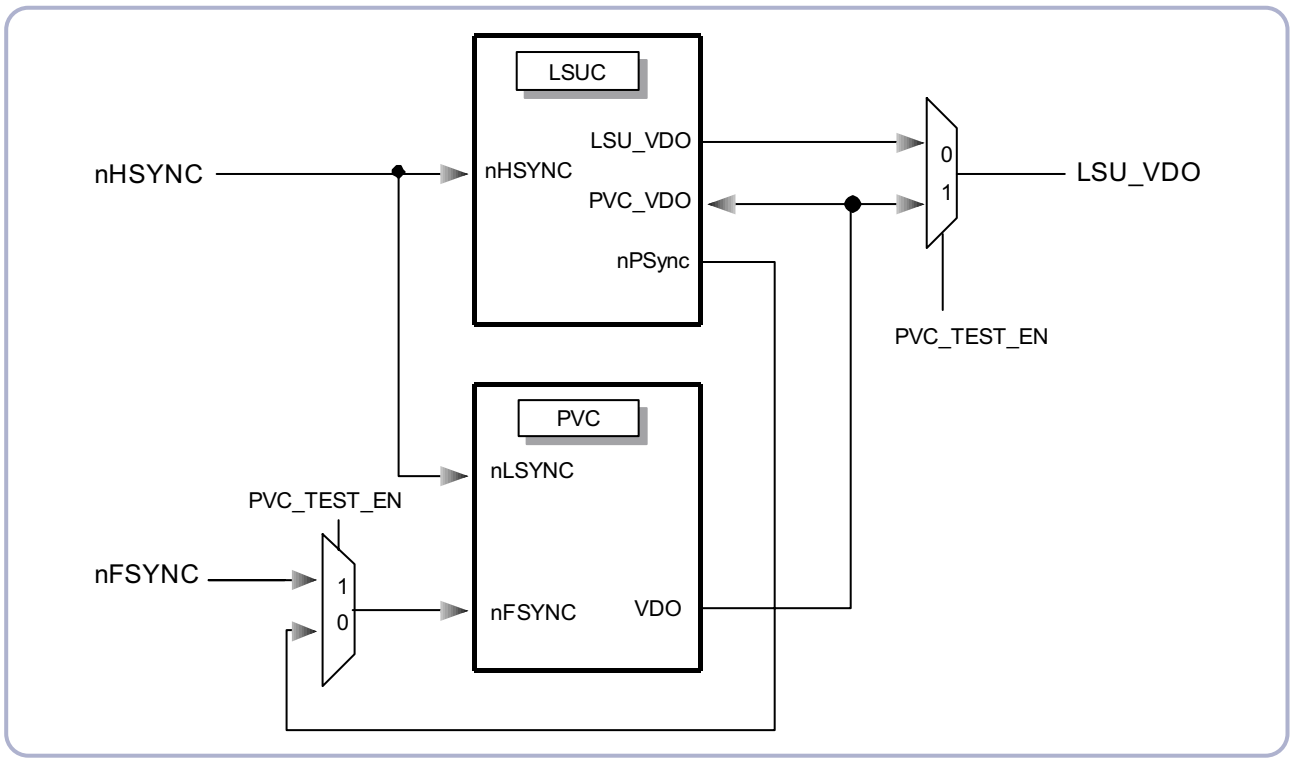
11.1.3 Motor Driver

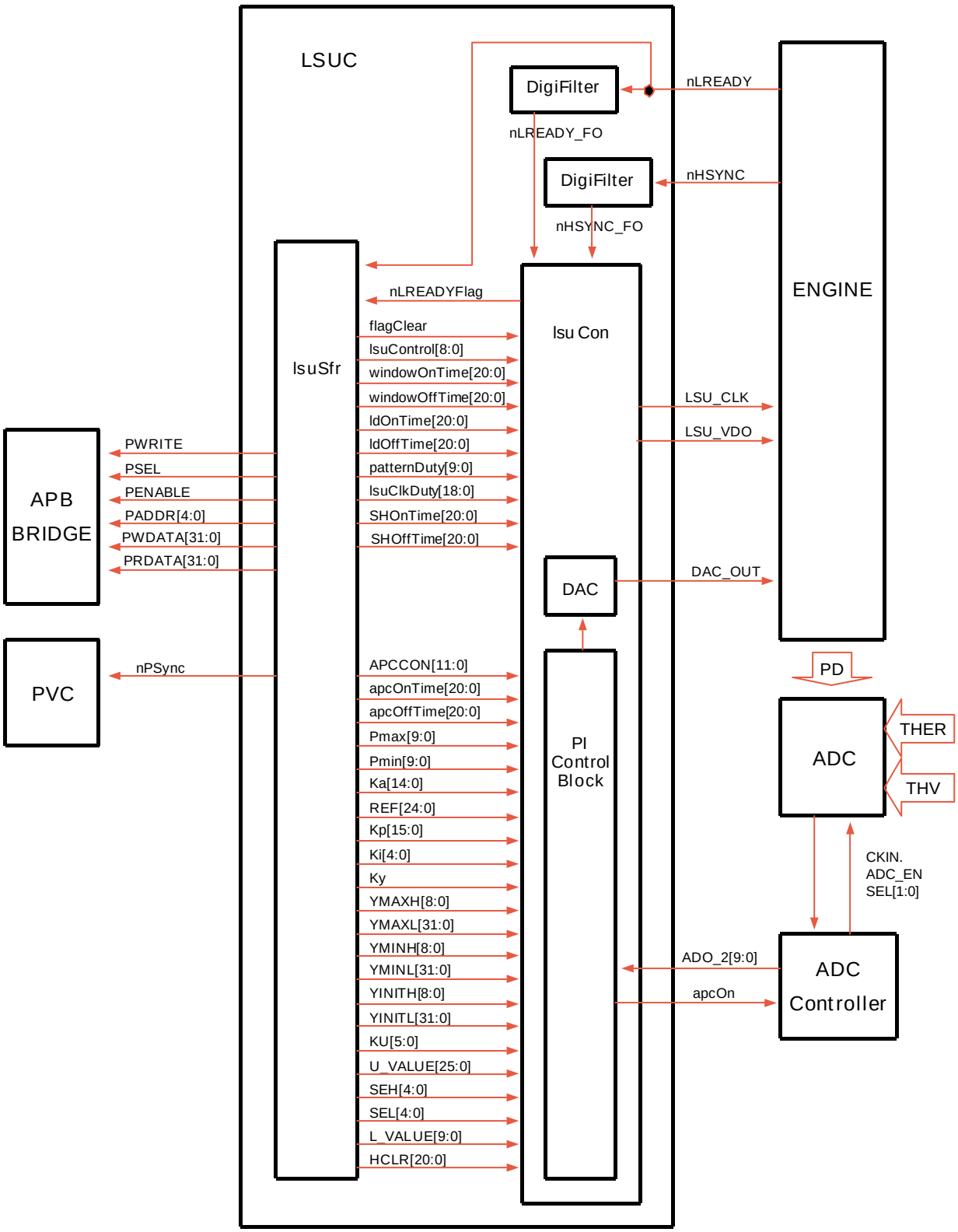
A motor drive circuit is decided when selecting a driver IC. (Supplied by vendor) ML1610 uses the motor driver IC of AN44060. However, the sensing resistance Rs value and the Vreference resistance value are variable according to the motor drive current value.

11.1.4 LSU Controller

The laser scanning unit controller (LSUC) of Jupiter4E is a block for interface between PVC block and LSU.
LSUC sends the video data received from PVC and the laser diode turn On/Off signal created by inner 21 bit counter to the laser diode of LSU. LSU creates the horizontal sync signal (nHSYNC) by sensing the inputted diode turn on/off signal with the attached sensor. nHSYNC is inputted to PVC and LSUC as a signal that informs the beginning of one line. Also, LSU makes the activity of nLREADY signal (ready to print) low when the polygon motor becomes regularly rotating. LSU can recognize the regular rotation status of the polygon motor by reading nLREADYFlag bit in SFR. Once the polygon motor regularly rotates, it sends the page sync signal (nPSync) to PVC by writing '1' at LSUCON[5] in LSUC, and PVC starts operating for one page printing. After that, every time nHSYNC signal is created, PVC senses the signal and outputs the video data (PVC_VDO) to LSUC. At this time, LSUC creates the video window (Printing area) and masks it on the video data sent by PVC. LSUC sends the completed video data (LSU_VDO) to the laser diode in LSU.
Also, LSUC supplies LSU_CLK, created by counting the system clock with the operation clock source of LSU, for the use of substitution for oscillator. The SFR is set up in IsuSfr block by receiving the bus control signal from APB bus, and the settled register values are redelivered to IsuCon block. IsuCon block creates a signal for controlling the laser diode of LSU and outputs it to a pad. The digital filter module is a digital filter to provide against the noise loaded in nHSYNC and nLREADY signal which directly get into the chip. It is three layer filter, and the delay time is 3*System Clock Time.

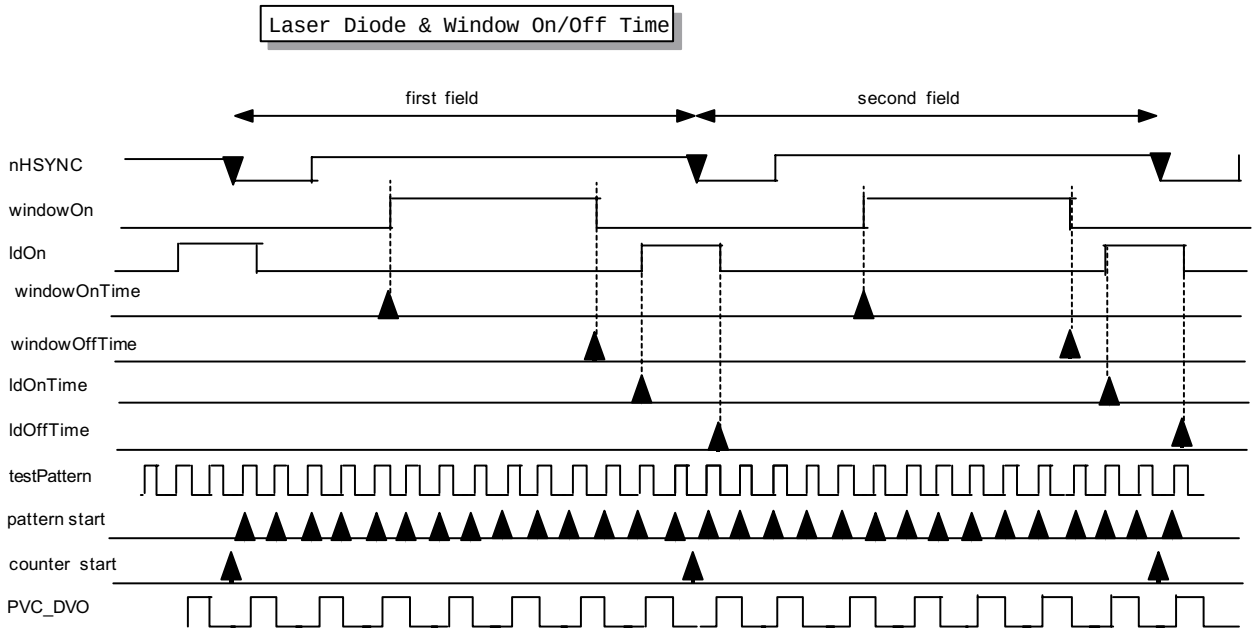
The interface between PVC and LSUC is shown in the picture.




LSUC
DigiFilter
nLREADY
nLREADY_FO
DigiFilter
nHSYNC
nHSYNC_FO
ENGINE
nLREADYFlag
lsuSfr
lsu Con
flagClear
lsuControl[8:0]
windowOnTime[20:0]
windowOffTime[20:0]
ldOnTime[20:0]
ldOffTime[20:0]
patternDuty[9:0]
lsuClkDuty[18:0]
SHOnTime[20:0]
SHOffTime[20:0]
LSU_CLK
LSU_VDO
APB BRIDGE
PWRITE
PSEL
PENABLE
PADDR[4:0]
PWDATA[31:0]
PRDATA[31:0]
DAC
DAC_OUT
PVC
nPSync
APCCON[11:0]
apcOnTime[20:0]
apcOffTime[20:0]
Pmax[9:0]
Pmin[9:0]
Ka[14:0]
REF[24:0]
Kp[15:0]
Ki[4:0]
Ky
YMAXH[8:0]
YMAXL[31:0]
YMINH[8:0]
YMINL[31:0]
YINITH[8:0]
YINITL[31:0]
KU[5:0]
U_VALUE[25:0]
SEH[4:0]
SEL[4:0]
L_VALUE[9:0]
HCLR[20:0]
PI Control Block
PD
ADC
THER
THV
CKIN.
ADC_EN
SEL[1:0]
ADO_2[9:0]
apcOn
ADC Controller

The main signals used in LSU Controller are shown in the table.

Name	Direction	Description
PVC-VDO	I	The video data output from PVC.
nLREADY	I	Its activity becomes low as the polygon motor of LSU gets the regular speed.
nHSYNC	I	It informs the beginning of one line. It is the same as nLSYNC of PVC.
nPSync	0	It is inputted to nFSync of PVC.
LSU_VDO	0	The completed video data output by masking video window on PVC_VOD.



11.1.5 ADC Controller

ChoursM ADC Controller has 8 analog input channels.
It automatically converts the 8 channels in turns with 10 bit 500KSPS adc1341x_pc, and also it makes the conversion on the desired time by manually controlling STC of the register. After finishing the conversion, it makes the interruption to be pending. When AD conversion of 3 rd channel ends for the PI Control of LSU, it sends the 10bit digital data converted with the latch short pulse signal to LSUC.

11.2 System Overview

SCX-4725FN is made Main Control part, Operation Panel part, PC Interface part, Scan part, Line Interface part, Power part.
Each part is independent with each other and the design concept is common use/standard design rule.
Chorus-M ASIC which is made for only printer is used in the Main Control part, and another Micom which can communicate with Chorus-M through UART for Key-Scan, LCD display, LED control, etc.. is used for OPE Panel part.
PC interface control part USB 2.0 Chorus-M Controller ASIC and Image processor is comprised in the Chorus-M Modem chip, SFX336 which make a function of FACSIMLE can the machine communicate with the other FAX machine on the speed of 33.6Kbps and the LIU(Line Interface Unit) supports the line connection with PABX or PSTN line.
Power part which made of two part-SMPS and HVPS-supplies Voltage source to the controller part and high voltage to the printing image developting process.

11.2.1 Engine H/W Specification

1) Recording Method : LSU(Laser Scanning Unit)
2) Printing Speed : 24ppm
   (In continuing printing base Letter, printing pages from 2nd to last during 1min)
3) Recording Density : 1200 dpi
4) Cassette Capa. : Cassette ; 250sheets(75g/㎡ Base),
   1-sheet Feeding : N/A((DRIVE Selection : Paper, OHP, Envelop - 1 sheet)
5) Manual Tray : All paper 1 sheet
6) Paper Size : Cassette, Manual ; Width = 76 ~ 216mm, Length = 125mm ~ 356mm
7) Effective recording size
   - A4 :202 x 291 mm
   - Letter : 208 x273mm
   - Legal : 208 x 350 mm
   - Folio : 208 x 325 mm
   - TopMargin: 2 ±2 mm
   - Left, Right Margin : 2 ±2 mm

8) CRU(Toner Cartridge)Life : 3,000pages Printing(A4, ISO 5% Pattern Printing)
9) First Print Out Time : within 11sec (Standby)
10) Warming up time : within 35sec (Ambient : 25 °C)

11.2.2 Main Board Control Part

Main control part of SCX-4725FN is made of ASIC(CPU, Image processor, PC I/F part include, Scan interface part, FAX Modem part and Printing process I/F part. CPU handles the BUS control, I/O interface, scan interface, PC interface and other miscellaneous driver circuit.

1) Main Board

- Main Board has a function of sending Current Image Video Data to LSU of the machine, controlling motor Driving Circuit and monitoring Paper Exit Sensor, Cover Open switch, OPE Panel Inputs.

2) Main Controller

- CPU : ARM 920T which is exclusive controller to execute Printer & FAX Function and to executs operation block by flash memory sithin system program, and ot control whale system.
  - · Main function block
  - · Completely integrated System for Embedded Applications
  - · PVC
    - Dual/Single Beam, - LVDS Pad(VDO, HSYNC), - Support A3 1200dpi, multi-pass color.
  - · HPVC
    - Dual/Single Beam, - LVDS Pad(VDO, HSYNC), - Support A4 600dpi, multi-pass color.
  - · DMA
    - 6 Channels (if not use CIP4e, 4ch is available for exfernal DMA.
      if CIP4E used (a^4 DMA channel use), 2ch available for external DMA.
  - · Operation Frequency : CPU Core -> over 300MHz, System Bus -> 100MHz
  - · Operation Voltage : CPU Voltage -> 1.2V, I/O Pad Voltage -> 3.3V, RTC Voltage -> 3V

- Flash Memory : Stores system program and can be updated to the newer system program code through the PC interface. It stores the FAX Journal List, One Touch dial number, speed dial number, and machine configuration setup data.
  - · Capcity : 16 Mbyte (NOR Type)
  - · Access Time : 70 nsec

- SDRAM : SDRAM is used for Print Buffer, Scan buffer when scanning, ECM Buffer when FAX Receiving, and system working memory.
  - · Capacity : 32 Mbyte
  - · Access Time : 166MHz(Max)
  - · Data Backup : 48 Hours
  - · Backup Battery Charging Time : 100hours when completely discharged.

11.2.3 Scan Part

1) Image Signal Input Part

- Image Signal from CIS has a level of about 1.2V and is goes to ADC of Chorus2. After ADC, CIS analog signal will be converted to 8-bit Digital signal.

2) Image Processing

- On the surface of the original paper, the light from the CIS LED reflected and goes to the CIS Sensor. Then the light is converted to the appropriate voltage suitable for ADC input. Analog signal from CIS sensor is used for ADC input then is converted to 8-bit digital data. Image processor of the Chorus2 will do the Shading correction function at first, then Gamma correction function next. After then, the data goes to different module according to the copy or FAX resolution mode. When Text mode, the image data goes to LAT module, when Photo mode, the image data goes to Error Diffusion module, when PC-Scan mode, the image data goes directly to the PC through DMA access.

  · Summary of the Image sensor interface is as below;
  - Minimum Scan Line Time :1.5ms
  - Scan Resolution : 600*600 dpi
  - Scan Width : 208mm
  - Function
    · White Shading Correction
    · Gamma Correction
    · CIS Interface
    · 256 Gray Scale

3) CIS Driving Part

- CIS Supply Voltage : +3.3V
- CIS Max frequency : 5MHz
- CISLinetime
  · Fax/Copy - 1.5ms
  · PC-Scan - 4.5ms
- White output volt. : Max 0.8V

4) ADF Driving Part : Driving ADF Stepper motor, and the maximum motor speed is 2000PPS.

- MOTOR DRIVER : A3978(Allegro)
- Driving Voltage : 24V DC
- Phase : 2-2 Phase 2000PPS at Quick Scan,
  2-2 Phase 1000PPS AT Fine Scan,
  2-2 Phase 667PPS AT Super Fine Scan

11.2.4 FAX Modem Part

1) Modem Part

- The modem part is consist SFX336(FAX Modem chip), LIU(Line Interface Unit) and Data Access Ayyangement (DAA)

Modem (SFX336) specification.

- 2-wire half-duplex fax modem modes with send and receive data rates up to 33,600 bps
- V.17, V.34, V.29, V.27 ter, and V.21 Channel 2
- Short train option in V.17 and V.27 ter
- PSTN session starting
- V.8 and V.8bis signaling
- HDLC support at all speeds
- Flag generation, 0-bit stuffing, ITU CRC-16 or CRC-32 calculation and generation
- Flag detection, 0-bit deletion, ITU CRC-16 or CRC-32 check sum error detection
- FSK flag pattern detection during high-speed receiving
- Tone modes and features
- Programmable single or dual tone generation
- DTMF receiver
- Tone detection with three programmable tone detectors
- Receive dynamic range:
- 0 dBm to -43 dBm for V.17, V.29, V.27 ter and V.21 Channel 2
- 9dBm to -43 dBm for V.34 half-duplex
- Digital speaker output to monitor received signal
- Two16-byte FIFO data buffers for burst data transfer with extension up to 255 bytes
- V.21 Channel 1Flag detect
- V.21 Channel 1Flag detect
- +3.3V only operation
- Typical power consumption
- Normal mode: 264 mW

11.2.5 Printing Process Part

Printing Process part is made of PC-Interface part, PVC(Priter Video Controller), LSU control part, High Voltage control part and Fuser Unit control part. PC-interface core is included in the Chorus2 ASIC and controls the PC-interface. LSU control part controls the LSU polygon motor, Laser diode, video data output so thatthe printing image can be made up on the OPC Drum.

11.2.6 Line Interface Part

Line interface part helps the machine connect to the PSTN or PABX Line.

Its main function is Line connection, Line state monitoring and TAD interface that enables a extension telephone or TAD machine to the SCX-4725FN machine.

11.2.7 Engine Paper Feeding

1) Feeding Type : MP Cassette Type
2) Feeding Standard : Center Loading
3) Feeding Qty : Cassette 150 sheets (75g/㎡, 20lb paper standard)
4) 1 sheet (Paper, OHP, Envelope etc.)
5) Separating Type: Cassette - Friction Pad Type
6) Manual Tray : 1 sheet
7) Driver Type : Driving by Gearing from Main Motor
8) Pick_up Roller Driver : Solenoid
9) Pick up Roller Rubber Material : EPDM+IR μ=1.3 or more
10) Pick up Velocity : 94.8731mm/Sec (Process : 93.0667mm/sec)
11) Paper detecting Sensor : Photo Sensor
12) Paper Size Sensor : None
13) Paper Separating Pad Material : NBB 52 °, μ=0.8~1.2
14) Separating Pad Pressure : TBD 150 gf
15) Pick_up Roller RPM : 47.683 RPM
16) Feeding Pressure (Same as Transfer Roller)
    : TBD 150~200gf (SPRING H mm, based on 1sheet)
      TBD 150~200gf (SPRING H mm, based on 150sheets)
17) Paper Exit Type : Face Down
18) Feed Roller Force : TBD Kg.f or more.
19) Spring Feed Tensile Force : TBD gf
20) Feed roller Velocity : mm/sec
21) Feed Roller Material : -
22) Exit Sensor : Photo Sensor

11.2.8 Deverope Process

- Developing Method : Non magnetic 1 element contacting method
- Toner : Non magnetic 1 element shatter type toner
- Toner Qty : 35gf /60gf (1k/3k)
- The life span of toner 1k/3k sheets (ISO Std. Coverage)
- Toner Residual Sensor : None
- OPC Cleaning : Use the conventional cleaning blade
- Handling of wasted toner : Discard by collecting waste-toner at waste-toner bin.
- OPC Drum Protecting Shutter : None
- Classifying device for toner cartridge: ID is classified by interruption of the frame channel.
- Development Roller type : conductive elastic roller
- Doctor BLADE Type : Regulating toner layer by pressure
- Charge Roller Type : Conductive Roller Contact-Charge

11.2.9 Sanner Part

600dpi Color CIS Module for Flat bed, SCX-4725FN uses the CIS scanning method

1) CIS SPEC
- Scanning size : 216 mm (width for letter-size)
- Light source : LED
- Scanning sensor: CIS 600/300 dpi
- Scanning mode : Color SCAN / Mono SCAN
- MTF : 30% (300 dpi Chart)
- CIS interface : Analog output
- Power supply : 3.3V
- Clock Frequency: 5.5MHz max.
- Number of output : 1
- LED Current : Green/Blue : 50mA, Red : 60mA
- Clamp Level : 1.4V
- Connection : 12 pin FFC connector (pitch 1.0mm)

2) Scan Resolution

(a) Transmission
- Normal : Vertial: 3.85 Line/mm, Horizontal: 8 Pels/mm : 203 x 98dpi
- Fine : Vertial: 7.7 Line/mm, Horizontal: 8 Pels/mm : 203 x 196dpi
- Super Fine : Vertial: 11.8 Line/mm, Horizontal: 11.8 Pels/mm ; 300 x 300dpi

(b) When Copy : Vertial: 11.8 Line/mm, Horizontal: 23.6 Pels/mm : 600x300dpi(ADF)
Vertial: 23.6 Line/mm, Horizontal: 23.6 Pels/mm : 600x600dpi(Platen)

3) Half Tone (Gray Scale) : 256 Levels

4) Scan Line Time
(a) Tx
- Normal : 1.5 ms/Line
- Fine : 1.5 ms/Line
- Super Fine : 1.5 ms/Line

(b) Copy : 1.5 ms/Line
(c) Scan
- Color : 4.5msec/line
- Gray : 4.5msec/line
- Mono : 4.5msec/line

5) Scanning Width
- MAX SCAN WIDTH : 216 mm (8.5 inches)
- Effective Scan Width: 208mm

6) ADF Motor
(a) Motor Spec
- 정격전압 : 24VDC
- 정격전류 : 0.6A(Peak)

7) Motor Driver speed & method
(a) FAX Transmission
- Normal Mode : 2000 pps, 2-2
- Fine Mode : 1000 pps, 2-2
- Super Fine Mode : 667 pps, 2-2

(b) Copy Job : 667 pps, 2-2
- max(30sheets) : 50gf
- min(1sheets) : 20gf

8) Document Detect sensor
(a) Type : Photo interrupt
(b) Position : ADF PBA
(c) LED - max current : 30mA
- max voltage : 3.3V

(d) Output - Logic "H" : No Paper
- Logic "L" : Paper

(e) Lever-Sensor DOC : ADF Lower Torsion Spring

9) Regi Detect sensor
(a) Type : Photo interrupt
(b) Position : ADF PBA
(c) LED - max current : 50mA
- max voltage : 3.3V

(d) Output - Logic "H" : No Paper
- Logic "L" : Paper

(e) Lever-Sensor DOC : ADF Lower Torsion Spring

10) Document Scan sensor
(a) Type : Photo interrupt
(b) Position : ADF PBA
(c) LED : - Max current : 50mA
- Max Voltage : 3.3V
(d) Output - Logic "H" : Off(No Position), No Paper
- Logic "L" : On (Doc Position), Paper
(e) LEVER - SENSOR SCAN : Scan Lower Torsion Spring

11.2.10 OPE(Operational Panel Equipment)

1) Ope Panel

OPE Panel has a MICOM Chip on it and communicates with Main CPU using Serial communication Line(SIO). OPE Panel consists of Micom, Key Matrix Part, LED Driving Part and LCD Part.

2) Key Description

No	Part	Feature	Function
1	Common	3*4Key	Dialing and Option Input
		Start	Starting Fax/Copy Job
		Stop/Clear	Cancel Current Job/Return to default
		Menu	Option select
		Upper Level	Return to upper level menu
		Enter	Option select/Execute
		▶	Next menu or Next option item
		◀	Previous menu or Previous option item
2	Save	Toner Save	TONER SAVE MODE select
3	Copy	Reduce/Enlarge	Select ZOOM ratio when copy
		No.of Copies	Select the number of copies
		Original Type	Change Copy Modes(Text,Text/Photo,Photo)
		Darkness	Change the Darkness of the Copied image (Light/Normal/Dark)
		Favorite Copy	Select one of the predefined Copy templates.
4	Fax	Resolution	STANDARD>FINE>SUPER FINE>PHOTO>COLOR
		Phone Book	Search the user defined Phone number.
		Broadcasting	When sending FAX data to many place in the same time.
		On Hook Dial	On Hook Dial
		Redial / Pause	Last number Redial / Pause
5	Scan	Scan to	select [scan to PC], [scan to FAX], [scan to E-mail] function.

3) LCD Part

- Number of Characters : 16 Characters x 2 line
  - · Clock, Date display
  - · System Status display
  - · Alarm, Error Message display
  - · Function Dialog Message display

ELECTRONICS

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